- WARNING -

Shoot only at Aqua Sling targets, not at people or personal property. Water balloons launched from a sling shot travel at speeds fast enough to cause serious injury, especially to eyes. (don't intend to hit face) *See reverse for condition of sale & instructions.*

The back side of the display contains warnings and instructional information. The warnings are as follows.

WARNING! WARNING! WARNING! WARNING!
FOLLOW INSTRUCTIONS - SERIOUS INJURY OR PROPERTY DAMAGE CAN RESULT FROM IMPROPER USE. AQUA SLING IS NOT FOR USE BY ANYONE UNDER AGE OF 21 WITHOUT ADULT SUPERVISION.

ONE PERSON OPERATION: WARNING: DO NOT ATTEMPT - SERIOUS INJURY MAY RESULT. AQUA SLING IS NOT DESIGNED FOR USE BY ONLY ONE PERSON.

However, in their promotion literature, there is a picture of one-person using the Aqua Sling.

The instructions contain the following information.

THREE PERSON OPERATION: Recommended as safest and most effective technique. Two (2) holders stand two feet apart facing target, each firmly grasping one sponge grip and tubing connector with their inside hand, stretching toward target at shoulder level until arm is fully extended. Opposite hand can be used to steady wrist. Launcher will stand between and behind the holders, firmly grasping the pouch handle with one hand while supporting the balloon in the pouch with the other hand. The launcher will pull back, aim and launch balloon at Aqua Sling target.

1) Aqua Sling is an adult game made for the sole purpose of launching special Aqua Sling balloons at Aqua Sling targets supplied with the game.

2) Never use Aqua Sling if there are signs of wear - Check before each use.

3) Holders should not insert hands between tubing and sponge grip. (Grasp sponge grip and tubing together in one hand.)

4) Never stretch tubing more than six (6) feet when launching balloons.

5) Fill balloons to size of tennis ball for best results. (over-filled balloons can explode when launched)

6) Holders & launcher must be sure that tubing on each side is parallel and separated, not twisted and touching - See photo on reverse.

Some of the Human Factors staff tried this product and obtained the following information.

- Balloons could be aimed fairly accurately, some landing within 5 feet of target.
- Balloons did not shoot as far as advertised.
- There are strength demands on the users of the product. The two people holding the handles must be able to keep hold of the handles while the person in back pulls the tubing back.
- All balloons burst when they hit the ground.
- The trajectory of most of the balloons in flight was relatively flat.
- In some cases, the balloons fell out of the pouch before being fired or burst during release from the sling.

Over 22 incidents have been investigated or reported by NEISS. The injuries are severe, ranging from ~~lacerations~~ loss of eye vision to fractured facial bones to cardiac arrest. The following IDIs were available for review at this time:

- 941214CWE5020 - A 13-year-old female was unexpectedly hit by a water balloon launched by a sling-shot balloon launcher (exact brand is unknown). Resultant injury is a fractured collar bone, which was originally misdiagnosed as muscle injury. Victim has mobility and strength problems with arms as a result of the injury.
- 940812CCN2165 - A 9-year-old female was hit from approximately 100 yards away as she and her friends were trying to catch balloons fired from an Aqua Sling. The balloon moved so fast the victim could not get out of its way. Resultant injuries were eye injuries and fractured facial bones.
- 940609CCN1653 - A 12-year-old male was hit in the face as he walked towards some "friends" playing with an Aqua Sling. Victim was approximately 100 feet away when struck by balloon. Resultant injuries were internal bleeding in the eye and a tear to the iris of the right eye, no permanent damage.
- 911021CNE5014 - A 14-year-old male received injuries while using an Aqua Sling. It is unknown whether a backfired balloon or the recoil of the sling struck his eye. He has lost 75 percent of the vision in his right eye. Claims to have been using the sling according to the instructions

- 910917CCN2267 - A 34-year-old male was hit in face during water balloon battle with his 15-year-old son. Both were using Aqua Slings and had the ends tied to a fixed object. The man temporarily lost his vision, received treatment, missed 6 weeks of work but eventually recovered from the injury. Victim stated he noticed the warnings but did not take them seriously.
- 890925WES4006 - A nine-year-old male was hit in the chest by three men firing balloons using a sling-shot type device. The victim was knocked unconscious and suffered cardiac arrest but was revived.
- 881007WES4003 - A 10-year-old male was hit below the left eye as he was watching but not participating in a water balloon fight using sling-shot balloon launchers. He was approximately 200-300 feet away and was knocked unconscious for about 20-30 seconds. Diagnosed with a macular hole in left eye and fractures to facial bones.

Additionally, some information on court cases for which in-depth investigations have not been conducted reveals that victims substitute rocks and potatoes for water balloons. These objects are reported to have backfired and injured the person pulling the sling-shot back.

The following variables appear to be important to the accident scenario.

- Several of the victims were bystanders. The manufacturers claim that the object can shoot up to 200 yards so that people may think they are at a safe range from the shooting.
- There is little opportunity for reaction time to escape the balloon. A company that makes a similar product to the Aqua Sling claims that water balloons fired from a sling-shot can move as fast as 240 mph.
- There seems to be little motivation to comply with product warnings. In fact, one victim stated that he noticed the warnings but did not take them seriously.

Discussion

Item #1: Evaluate the likely ages of users

This product is a fun product that, contrary to the products warnings, tends to be used in water fights. Even in situations in which the product is used by adults or under adult supervision (as the labels state), the product is likely to be misused.

This product is expected to have wide appeal ranging from young children to adults. Water balloons and sling-shots have proven through the years to be appealing to children. Research indicates that projectile guns are not appropriate before age five or six years because children younger than that are not likely to be able to aim the device properly or follow instructions about where and how to shoot (Abt Associates Inc, 1985).

Item #2: Evaluate likely type of play by those users

The users may start out using the product according to the instructions. However, unless there is some type of competition involved, it is likely to become boring and more interesting objects (that is, moving targets) will probably become the objective of the balloon launchers.

Item #3: Evaluate perception of risk of injury by those users

The threat of hitting somebody with a water balloon is not likely to bring to mind serious injuries, rather the intent is to soak the person with a water balloon. However, these water balloons can be shot at high speeds, much higher than can be achieved by a thrown water balloon. Generally, the perceived hazardousness of water balloons is expected to be low. Even though users see how far they can launch a balloon and how fast it goes, it is unlikely that they will perceive the balloon launcher as a dangerous product.

The user's previous experience with water balloons will affect the perceived hazardousness of the product. Research indicates that as consumers become increasingly familiar with a product, they are more likely to ignore information, such as warnings, related to the product (Karnes, Leonard, & Rachwal; 1986). This finding is supported by the victim who said that he noticed the warnings but did not take them seriously. = throwing

Item #4: Evaluate present label information to direct type of play

As stated in the background section, the label fails to motivate the users to avoid shooting at people. Regarding the age limit for users (over 21 or supervised by an adult), in a couple of the incidents, the balloons were fired by adults or with adults present. In some of these cases, the adults were firing balloons at children. Therefore, directing that the product only be used by people over the age of 21 or with adult supervision is inadequate.

Additionally, the thrill of shooting at a small stationary target is likely to quickly diminish, unless there is some type of competition involved. Once a user has hit the target (or can't hit the target!) then they are likely to look for something more challenging, such as a moving target.

Item #5: Evaluate label effectiveness to address perception of water-filled balloons as causing serious injury.

The label states the consequences as "serious injury" which is a vague term. Research indicates that the explicitness of potential injury severity in warning labels has some effect on the perception of hazardousness for a product (Laughery & Stanush, 1989). More explicit labels help people understand hazards and provides them with necessary safety information. It seems that people do not consider water balloons as hazardous objects, even if they are fired out of a sling shot at high speeds.

Item #6: Suggest label that would change perception of water-filled balloons as causing serious injury and also to not use to water-soak people.

Labeling is likely to be disregarded on this product for the following reasons.

1) The product may have been purchased to water-soak people.
2) Water balloons are not perceived as being dangerous.
3) This is a fun-oriented product, users may not be seeking safety information and therefore may not notice a warning label or take it seriously.

Therefore, a warning label is insufficient in addressing the product hazard. However, if it is determined that a label must be used for reasons of liability, then it must be more explicit. If the warning is more explicit, then it may raise the perception of hazardousness for those users who read it. An example of a more explicit label appears below.

⚠ WARNING
Fractures or severe eye injuries. Balloons are shot at high speeds. Impact of balloon can break bones and cause temporary/permanent blindness.

← reverse these hazards

Conclusion

This product propels water balloons at a much higher speed than can be achieved by throwing. As a result, severe injuries such as facial fractures and loss of eyesight can occur. This product is likely to have appeal to both children and adults and is likely to be misused. Unless competition is involved, it is likely that consumers will shoot water balloons at people to make it more interesting. Based on consumers' previous experience with water balloons. the perceived hazardousness is probably low.

Warning information is likely to be ignored or not taken seriously because the product is a water fun toy. Consumers who purchase this product are probably not seeking warning information, they are purchasing a fun product for their leisure time. Therefore, a warning label is not an adequate solution to the product hazard.

This is not in same category as other projectile toys (bow + arrow, Darts, B B guns, horseshoes, Frisbees) are games of skill involving 1 person. they are hard note. 177

References

Abt Associates Inc. (1985). Guidelines for relating children's ages to toy characteristics.

Karnes, E.W., Leonard, S.D., & Rachwal, G. (1986). Effects of benign experiences on the perception of risk. Proceedings of the Human Factors Society 30th annual meeting, pgs. 121-125.

Laughery, K.R. & Stanush, J.A. (1989). Effects of warning explicitness on product perceptions. Proceeding of the Human Factors Society 33rd annual meeting, pgs 431-435.

bcc:
Verhalen
Official
Rytina
✓Schoem (2)
EPHF:SWEET:2/22/95

124

PSA ACTION (FOR PSA USE ONLY)

Request number: 9984

Date Processed: 1/23/95

Date Requested: _____

Due Date: 2/6/95

Assigned to:

Organization: HF

T.O.: _____

Req. Summary: _____

****FOR OFFICIAL USE ONLY****

PRODUCT SAFETY ASSESSMENT (PSA) TECHNICAL EVALUATION REQUEST
Note: Print, use black pen, no blue ink.

Requested by: Jean Kennedy Org. Codes: CECA FOWR

Date: 1/19/95 _____ Priority: B Case# FW950004

PRODUCT INFORMATION

Manufacturer: Riva Sport (and others) State: CA

Product: Aqua Sling - a water balloon launcher (toy?)
[there will possibly be other manuf samples which are basically the same]

Sample number: _____

Sample Disposition: _XXReturn to Requestor ___Store at Whse ___Other: _____

EVALUATION REQUESTED: HF:1.Evaluate likely ages of users. _____
2.Evaluate likely type of play by those users.
3.Evaluate perception of risk of injury by those users.
4.Evaluate present label information to direct type of play.
5.Evaluate label effectiveness to address perception of water-filled balloons as causing serious injury.
6.Suggest label that would change perception of water-filled balloons as causing serious injury and also to not use to water-soak people.

EPI ASSESSMENT: Dates: From _____ TO _____ Sort by Mfg. ___Yes ___No

___IDI ___IPII ___NEISS Comments ___NEISS Estimates ___Deaths ___NFIRS

Hazard: eye injury, i.e. retinal tears, hemorrage, cut iris, orbital fracture or "blowout"

(Rev 6/94 fppsa)

Requested date: February ~~6~~ 20, 1995
Attachments: If you want IDIs, I can provide those. Perhaps this is a reference source answer.

Comments: Set up a meeting with J Kennedy & M. Gidding to discuss.

U.S. CONSUMER PRODUCT SAFETY COMMISSION

FOR OFFICIAL USE ONLY

CPSC FORM 183 (4/92)

125

United States
CONSUMER PRODUCT SAFETY COMMISSION
Washington, D.C. 20207

MEMORANDUM

DATE: FEB 23 1995

TO : Jean Kennedy, CECA

Through: Dr. Robert D. Verhalen, Associate Executive Director
Directorate for Epidemiology

Factors that contrib. to injury

FROM: George Sweet, EPHF, 504-0468 (x1283)

SUBJECT: PSA # 9984; Riva Sport Aqua Sling

Request

The Office of Compliance and Enforcement asked the Division of Human Factors to complete the following tasks: 1) evaluate likely ages of users, 2) evaluate likely type of play by those users, 3) evaluate perception of risk of injury by those users, 4) evaluate present label information to direct type of play, 5) evaluate label effectiveness to address perception of water-filled balloons as causing serious injury, and 6) suggest label that would change perception of water-filled balloons as causing serious injury and also to not use to water-soak people.

Background

The subject product is a large sling-shot water balloon launcher. It consists of three main parts.

- Two 4-inch-long foam handles at each end.
- Rubber tubing extending from handle to handle (approximately 66 inches or 5 1/2 feet long when not stretched). The circumference of the tubing is approximately 1 1/4 inches.
- A 7 1/4 inch square pouch that has a strap attached to the back of it.

Additionally, a 9-inch square plastic target is included with the product. The front of the package states "For ages 21 and over" and in small print (capital letters are approximately 1/16 inches high) a warning on proper use and balloon choking hazard. The warning on proper use is as follows:

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- WARNING -

Shoot only at Aqua Sling targets, not at people or personal property. Water balloons launched from a sling shot travel at speeds fast enough to cause serious injury, especially to eyes. (do not intend to hit face) See reverse for condition of sale & instructions.

The back side of the display contains warnings and instructional information. The warnings are as follows.

WARNING! WARNING! WARNING! WARNING!
FOLLOW INSTRUCTIONS - SERIOUS INJURY OR PROPERTY DAMAGE CAN RESULT FROM IMPROPER USE. AQUA SLING IS NOT FOR USE BY ANYONE UNDER AGE OF 21 WITHOUT ADULT SUPERVISION. 18y-21y

ONE PERSON OPERATION: WARNING: DO NOT ATTEMPT - SERIOUS INJURY MAY RESULT. AQUA SLING IS NOT DESIGNED FOR USE BY ONLY ONE PERSON.

However, in their promotion literature, there is a picture of one-person using the Aqua Sling.

The instructions contain the following information.

THREE PERSON OPERATION: Recommended as safest and most effective technique. Two (2) holders stand two feet apart facing target, each firmly grasping one sponge grip and tubing connector with their inside hand, stretching toward target at shoulder level until arm is fully extended. Opposite hand can be used to steady wrist. Launcher will stand between and behind the holders, firmly grasping the pouch handle with one hand while supporting the balloon in the pouch with the other hand. The launcher will pull back, aim and launch balloon at Aqua Sling target.

1) Aqua Sling is an adult game made for the sole purpose of launching special Aqua Sling balloons at Aqua Sling targets supplied with the game.

2) Never use Aqua Sling if there are signs of wear - Check before each use.

3) Holders should not insert hands between tubing and sponge grip. (Grasp sponge grip and tubing together in one hand.)

4) Never stretch tubing more than six (6) feet when launching balloons.

5) Fill balloons to size of tennis ball for best results. (over-filled balloons can explode when launched)

6) Holders & launcher must be sure that tubing on each side is parallel and separated, not twisted and touching - See photo on reverse.

Some of the Human Factors staff tried this product and obtained the following information.

- Balloons could be aimed fairly accurately, some landing within 5 feet of target.
- Balloons did not shoot as far as advertised.
- There are strength demands on the users of the product. The two people holding the handles must be able to keep hold of the handles while the person in back pulls the tubing back.
- All balloons burst when they hit the ground.
- The trajectory of most of the balloons in flight was relatively flat.
- In some cases, the balloons fell out of the pouch before being fired or burst during release from the sling.

Over 22 incidents have been investigated or reported by NEISS. The injuries are severe, ranging from ~~lacerations~~ loss of eye vision to fractured facial bones to cardiac arrest. The following IDIs were available for review at this time:

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- 910917CCN2267 - A 34-year-old male was hit in face during water balloon battle with his 15-year-old son. Both were using Aqua Slings and had the ends tied to a fixed object. The man temporarily lost his vision, received treatment, missed 6 weeks of work but eventually recovered from the injury. Victim stated he noticed the warnings but did not take them seriously.
- 890925WES4006 - A nine-year-old male was hit in the chest by three men firing balloons using a sling-shot type device. The victim was knocked unconscious and suffered cardiac arrest but was revived.
- 881007WES4003 - A 10-year-old male was hit below the left eye as he was watching but not participating in a water balloon fight using sling-shot balloon launchers. He was approximately 200-300 feet away and was knocked unconscious for about 20-30 seconds. Diagnosed with a macular hole in left eye and fractures to facial bones.

Additionally, some information on court cases for which in-depth investigations have not been conducted reveals that victims substitute rocks and potatoes for water balloons. These objects are reported to have backfired and injured the person pulling the sling-shot back.

The following variables appear to be important to the accident scenario.

- Several of the victims were bystanders. The manufacturers claim that the object can shoot up to 200 yards so that people may think they are at a safe range from the shooting.
- There is little opportunity for reaction time to escape the balloon. A company that makes a similar product to the Aqua Sling claims that water balloons fired from a sling-shot can move as fast as 240 mph.
- There seems to be little motivation to comply with product warnings. In fact, one victim stated that he noticed the warnings but did not take them seriously.

Discussion

Item #1: Evaluate the likely ages of users

This product is a fun product that, contrary to the products warnings, tends to be used in water fights. Even in situations in which the product is used by adults or under adult supervision (as the labels state), the product is likely to be misused.

This product is expected to have wide appeal ranging from young children to adults. Water balloons and sling-shots have proven through the years to be appealing to children. Research indicates that projectile guns are not appropriate before age five or six years because children younger than that are not likely to be able to aim the device properly or follow instructions about where and how to shoot (Abt Associates Inc, 1985).

Item #2: Evaluate likely type of play by those users

The users may start out using the product according to the instructions. However, unless there is some type of competition involved, it is likely to become boring and more interesting objects (that is, moving targets) will probably become the objective of the balloon launchers.

Item #3: Evaluate perception of risk of injury by those users

The threat of hitting somebody with a water balloon is not likely to bring to mind serious injuries, rather the intent is to soak the person with a water balloon. However, these water balloons can be shot at high speeds, much higher than can be achieved by a thrown water balloon. Generally, the perceived hazardousness of water balloons is expected to be low. Even though users see how far they can launch a balloon and how fast it goes, it is unlikely that they will perceive the balloon launcher as a dangerous product.

The user's previous experience with water balloons will affect the perceived hazardousness of the product. Research indicates that as consumers become increasingly familiar with a product, they are more likely to ignore information, such as warnings, related to the product (Karnes, Leonard, & Rachwal; 1986). This finding is supported by the victim who said that he noticed the warnings but did not take them seriously.

Item #4: Evaluate present label information to direct type of play

As stated in the background section, the label fails to motivate the users to avoid shooting at people. Regarding the age limit for users (over 21 or supervised by an adult), in a couple of the incidents, the balloons were fired by adults or with adults present. In some of these cases, the adults were firing balloons at children. Therefore, directing that the product only be used by people over the age of 21 or with adult supervision is inadequate.

Additionally, the thrill of shooting at a small stationary target is likely to quickly diminish, unless there is some type of competition involved. Once a user has hit the target then they are likely to look for something more challenging, such as a moving target.

Item #5: Evaluate label effectiveness to address perception of water-filled balloons as causing serious injury.

The label states the consequences as "serious injury" which is a vague term. Research indicates that the explicitness of potential injury severity in warning labels has some effect on the perception of hazardousness for a product (Laughery & Stanush, 1989). More explicit labels help people understand hazards and provides them with necessary safety information. It seems that people do not consider water balloons as hazardous objects, even if they are fired out of a sling shot at high speeds.

Item #6: Suggest label that would change perception of water-filled balloons as causing serious injury and also to not use to water-soak people.

Labeling is likely to be disregarded on this product for the following reasons.

1) The product may have been purchased to water-soak people.
2) Water balloons are not perceived as being dangerous.
3) This is a fun-oriented product, users may not be seeking safety information and therefore may not notice a warning label or take it seriously.

Therefore, a warning label is insufficient in addressing the product hazard. However, if it is determined that a label must be used for reasons of liability, then it must be more explicit. If the warning is more explicit, then it may raise the perception of hazardousness for those users who read it. An example of a more explicit label appears below.

⚠ WARNING
Fractures or severe eye injuries. Balloons are shot at high speeds. Impact of balloon can break bones and cause temporary/permanent blindness.

← reverse these hazards

Conclusion

This product propels water balloons at a much higher speed than can be achieved by throwing. As a result, severe injuries such as facial fractures and loss of eyesight can occur. This product is likely to have appeal to both children and adults and is likely to be misused. Unless competition is involved, it is likely that consumers will shoot water balloons at people to make it more interesting. Based on consumers' previous experience with water balloons, the perceived hazardousness is probably low.

Warning information is likely to be ignored or not taken seriously because the product is a water fun toy. Consumers who purchase this product are probably not seeking warning information, they are purchasing a fun product for their leisure time. Therefore, a warning label is not an adequate solution to the product hazard.

This is not in same category as other projectile toys (bow + arrow, Darts, B-Bguns, horseshoes, Frisbees) are games of skill involving 1 person. they are hard [illegible]

References

Abt Associates Inc. (1985). Guidelines for relating children's ages to toy characteristics.

Karnes, E.W., Leonard, S.D., & Rachwal, G. (1986). Effects of benign experiences on the perception of risk. Proceedings of the Human Factors Society 30th annual meeting, pgs. 121-125.

Laughery, K.R. & Stanush, J.A. (1989). Effects of warning explicitness on product perceptions. Proceeding of the Human Factors Society 33rd annual meeting, pgs 431-435.

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EPHF:SWEET:2/22/95

****FOR OFFICIAL USE ONLY****

PRODUCT SAFETY ASSESSMENT (PSA) TECHNICAL EVALUATION REQUEST
Note: Print, use black pen, no blue ink.

Requested by: Jean Kennedy Org. Codes: CECA FOWR

Date: 2/24/95 Priority:A Case# FW950004

PRODUCT INFORMATION

Manufacturer: Riva Sport State: San Diego, CA

Product: water balloon slingshot

Sample number: T-793-0353 Sub 1 & 2 (100 & 200yd)

Sample Disposition: X Return to Requestor ___Store at Whse ___Other:

EVALUATION REQUESTED: ES - test launch velocities. for various weight projectiles at two different distances - Determine Energy at ~~test impact force~~ ~~from~~ several distances, e.g. 30yd, 50yd, 100yd

(See Ron Reichel & Mike Giddings for formulation of test Plan)

EPI ASSESSMENT: Dates: Sort by Mfg. __Yes ___No

__IDI __IPII ___NEISS Comments ___NEISS Estimates ___Deaths ___NFIRS

Hazard: eye injury

Requested date: 3/03/95 Attachments:

PSA ACTION (FOR PSA USE ONLY)

Request number: 0168

Date Processed: 2/27

Date Requested:

Due Date: 3/3

Assigned to: ES-E4

Organization:

T.O.:

Req. Summary:

2-28-95

(Rev 6/94 fppsa)

133

UNITED STATES GOVERNMENT

MEMORANDUM

U.S. CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, D.C. 20207
OCT 30 1989

TO : Terri Rogers, CARM

THROUGH: Frank Brauer, Project Manager, PSA Team
Andrew G. Ulsamer, Ph.D., AED, HS AGU
Marilyn L. Wind, Ph.D., Director, HSPS MLW

FROM : Robert G. Hazard, M.D., HSPS RGH.MD.

SUBJECT: Response to PSA Request No. 4743

Request:

The subject PSA requests HS to review injuries reported to CPSC caused by use of water balloon slingshots.

Background:

This product is a sling composed of surgical rubber tubing usually requiring three persons to operate and is used to launch water filled balloons at a velocity in excess of 200 feet/second at a range exceeding 100 yards.

Discussion:

There have been four injuries reported to CPSC caused by use of water balloon slingshots. Two of these injuries involved the face or eyes of the victim, one was reported to have caused a severe bruise, and one injury to the chest presumably caused a cardiac arrest. There is also one reported injury from a water balloon hurled from a rapidly moving car.

A 10 year old boy was struck by a water balloon below the left eye causing a fracture of the left eye orbit or bony socket of the eye (IDI 881007WES4003). This type of injury may occur when the force of a blunt object is exerted upon the orbit of the eye causing compression of the eyeball. There is expansion of the eyeball perpendicular to the direction of impact and this transmitted force can result in a "blowout" fracture of the orbital floor and medial wall. This type of fracture requires surgery to repair. In addition, in this particular case there was injury to the retina caused by the same transmitted force causing a partial loss of visual acuity in the left eye with a possible permanent partial vision loss.

Another injury involved a 24 year old male who was struck in the right eye by a water balloon while a spectator at a football game. The water balloon and launching sling were apparently homemade. The balloon presumably traveled 1,000 yards. Although this injury was similar to the one described above, it is difficult to relate it to this product because we do not know what the characteristics of this launching sling were. The injured man sustained a right sided optic neuropathy and a hole in the macula of the retina which has limited vision to 20/200 in the right eye. This victim also sustained an orbital blowout fracture which required surgery.

Another eye injury reported was sustained by a 16 year old male who was struck in the right eye by a water balloon. At the time of injury he was apparently riding on the hood of a car traveling approximately 60 miles per hour. He was struck in the face by a water balloon hurled from an oncoming car traveling approximately the same speed. This victim also sustained an orbital blowout fracture requiring a surgical repair and has subsequently made an uneventful recovery. Although this is similar to the first injury discussed it was not the result of a water balloon shot by a slingshot. However, it should be considered analogous because of the speed imparted to the balloon by the closing velocities of the two cars.

Two other injuries have been reported to CPSC but no medical records are available for review. A severe contusion (bruise) of the thigh was sustained by a 34 year old female passenger on a sailboat who was struck by a water balloon launched from a dock (IDI 890625WES4006). There is also a reported injury of a 9 year old male who was struck in the chest by a water balloon and although sustaining a loss of consciousness and cardiac arrest made an uneventful recovery (IDI 890925WES4006).

Conclusion:

Of the reported injuries that have been caused by water balloons which are documented by medical records, eye and facial injuries are the most serious. Injuries to other parts of the body would likely result in superficial injuries such as bruises with no permanent disability. A direct impact by a water balloon to the thorax or abdomen could result in serious injury. Cardiac arrest has been reported. Children could be at particular risk for this type of injury. Injuries caused by impact to the face and eye have caused documented severe injury requiring hospitalization and surgery. In two of the reported cases this type of injury has caused lifelong disability including partial loss of vision.

4-28

Jean.

My demonstration yielded a maximum range of approx. 250 ft, using the larger device. The initial velocity would have been approx. 65 miles/hr.

Roy (Deppa, ES)

****FOR OFFICIAL USE ONLY****

Ron Deppe
3/23

PRODUCT SAFETY ASSESSMENT (PSA) TECHNICAL EVALUATION REQUEST
Note: Print, use black pen, no blue ink.

Requested by: Jean Kennedy Org. Codes: CECA FOWR

Date: 2/24/95 Priority:A Case# FW950004

PRODUCT INFORMATION

Manufacturer: Riva Sport State: San Diego, CA

Product: water balloon slingshot

Sample number: T-793-0353 Sub 1 & 2 (100 & 200yd)

Sample Disposition: X_Return to Requestor ___Store at Whse ___Other:

EVALUATION REQUESTED: ES - test launch velocities. for various weight projectiles at two different distances - Determine Energy at ~~Test Impact force~~ ~~From~~ several distances, e.g. 30yd, 50yd, 100yd
(See Ron Reichel & Mike Giddings for formulation of test Plan)

EPI ASSESSMENT: Dates: Sort by Mfg. __Yes ___No

__IDI __IPII ___NEISS Comments ___NEISS Estimates ___Deaths ___NFIRS

Hazard: eye injury

Requested date: 3/03/95 Attachments:

PSA ACTION (FOR PSA USE ONLY)

Request number: 0168

Date Processed: 2/27

Date Requested:

Due Date: 3/3

Assigned to: ES-F4

Organization:

T.O.:

Req. Summary:

2-28-95

(Rev 6/94 fppsa)

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United States
CONSUMER PRODUCT SAFETY COMMISSION
Washington, D.C. 20207

MEMORANDUM

Date: April 5, 1995

To : Jean Kennedy, Division of Corrective Actions

Through: Marc Schoem, Director, Division of Corrective Actions
James F. Hoebel, Acting Director, Division of Mechanical Engineering

From: Roy W. Deppa, Division of Mechanical Engineering
Phone 301:504-0494 Ext. 1306

Subject: PSA 0168, RP950004, Riva Sport Water Balloon Slingshot

Ref: Sample Number T-793-0353

Request: Test launch velocities for various weight projectiles at two different distances, Determine energy at several distances, e.g. 30yd, 50yd, 100yd.

Discussion: The product is a type of slingshot designed to launch a water-filled balloon. The package contains the slingshot device, a bag of balloons, a nozzle for attachment to a hose bibb for filling the balloons, and a piece of red vinyl sheet approximately 23 cm square that is intended as a target. The slingshot is intended to be used by three people; one to pull back the pouch, aim and release the water balloon, the other two to hold the two ends of the device.

The file includes reports of incidents in which people were struck by the water ballon. Some of these incidents resulted in injury.

Two samples were provided, labeled by the manufacturer as "Recreation Model 100 YD Range" and "Competition Model, 200 YD Range". The significant difference between these two models is in the length of tubing.

As discussed previously, this assessment was limited to a small informal demonstration and analysis. The devices perform adequately, allowing reasonable aim to be achieved, and there appear to be no obvious deficiencies in construction. The labeling is inaccurate, however, as it is not possible under normal conditions to achieve anywhere near the 200 YD (approx. 185 meters) range claimed for the larger unit. Furthermore, the instructions state "Never stretch tubing more than six (6) feet when launching balloons." When stretched that distance, the longer device will launch a balloon approximately 30 meters. The device may be stretched

considerably farther than two meters. When stretched about four meters, however, the water balloon generally breaks on release. The shorter device may not be stretched as far, but when stretched very tightly at about 1.5 meters, it will launch a balloon about 40 meters, again far short of the claimed range.

At launch, the velocity of the water balloon is around 20 m/sec. Thus, the energy at launch of a balloon holding the recommended amount of water ("size of tennis balls") would be in the range of 25-30 joules.

Conclusion: ES does not believe the product contains a deficiency in either design or construction that presents an unexpected hazard. The energy at launch of a balloon filled according to instructions is about equal to that of a baseball thrown in youth leagues. (This comparison is not useful in visualizing impact, however, as the impact characteristics of baseballs and water balloons are not similar.) The manufacturer's claimed ranges for the two samples are not realistic. ES recommends no further technical activity.

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PSA ACTION (FOR PSA USE ONLY)

Request number: 0638

Date Processed: 6/12/95

Date Requested:

Due Date: 6/15/95?

Assigned to:

Organization: E-6

T.O.:

Req. Summary:

****FOR OFFICIAL USE ONLY****

PRODUCT SAFETY ASSESSMENT (PSA) TECHNICAL EVALUATION REQUEST

Note: Print, use black pen, no blue ink.

Requested by: J. Kennedy Org. Codes: CECA FO__R

Date: June 12, 1995 Priority: AB Case#

PRODUCT INFORMATION

Manufacturer: Riva Sports State: CA

Product: Water ballon Slingshot "Agua Sling"

Brand name, model, etc.

Sample number: T-793-0463 Sur1 + 2

Sample Disposition: __Return to Requestor __Store at Whse __Other:

EVALUATION REQUESTED: Fill ballons about the size of tennis balls weigh, make a least 10 Trials to measure average velocity using photoelectric screens. Call Ron Reichel for tips on testing. (Try smaller ballons if time permits.) Verbal report on velocity measurements ASAP. (Short Memo Please)

6-12-95

EPI ASSESSMENT: Dates: From_____ TO_____ Sort by Mfg. __Yes __No

__IDI __IPII __NEISS Comments __NEISS Estimates __Deaths __NFIRS

Hazard:

Requested date: 6/15/95 or sooner Attachments:

(Rev 6/94 fppsa)

Kronograph = Photo electric screens (2)
Measures in micro-seconds

PSA 0638 6-13-95

FROM: ROBERT HUNDEMER; LS

TO: J. KENNEDY; CECA

SUBJECT: SPEED MEASUREMENTS OF WATER BALLOONS.

SHORT GREEN DEVICE

WEIGHT IN GRAMS	PULL DISTANCE	FEET PER SEC.	
1 239	30 INCHES	68	
2 213	30 INCHES	68	
3 203	30 INCHES	76	
4 250	30 INCHES	61	
5 259	30 INCHES	66	
6 307	30 INCHES	59	
7 279	41 INCHES	81	
8 260	41 INCHES = 3ft 5in	80	= 55 mph

LONG ORANGE DEVICE

WEIGHT IN GRAMS	PULL DISTANCE	FEET PER SEC.	
1 252	42 INCHES	70	
2 179	42 INCHES	83	
3 200	42 INCHES	77	
4 167	42 INCHES	83	
5 327	42 INCHES	73	
6 298	42 INCHES	62	
7 270	42 INCHES	72	
8 370	42 INCHES = 3ft 6in	73	= 50 mph
9 288	60 INCHES = 5ft *	109	= 74.3 mph

* Directions call for 6ft maximum extension.