March 5, 1963 A. K. MELIN 3,079,728

HOOP TOY

Filed May 13, 1959

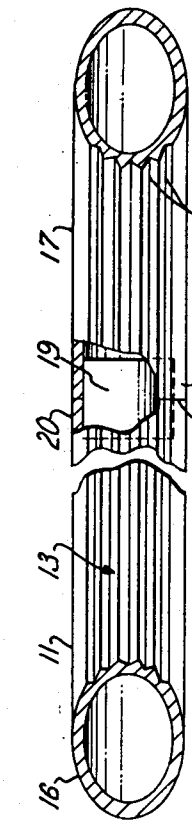



Fig. 2.

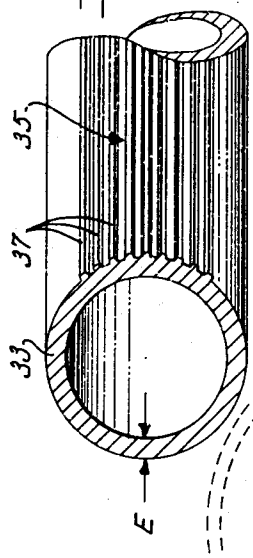



Fig. 3.

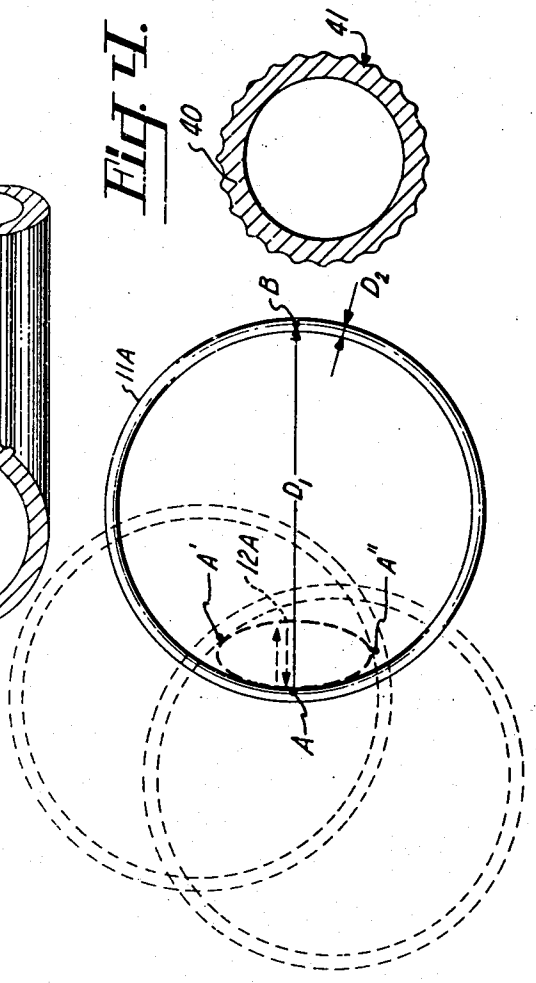



Fig. 4.

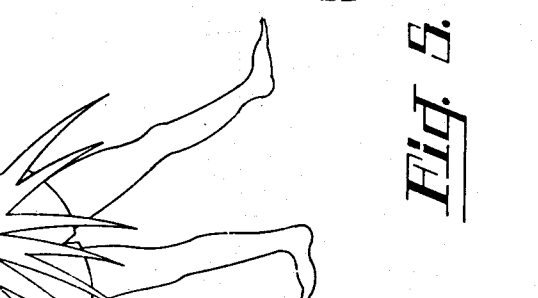


Fig. 5.




Fig. 1.

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# HOOP TOY

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The invention relates to toys and more particularly to toys in the form of a hoop for use about the body of a user, and is a continuation-in-part of my co-pending application, Serial No. 756,099, filed August 20, 1958, and entitled "Hoop Toy," now abandoned.

Many recreational devices and toys exist which combine recreation with physical benefit. Some of these devices are relatively expensive both in initial cost and subsequent maintenance. Other devices are difficult to use because they involve complicated procedures and long learning periods. I have invented a toy which is economical to fabricate and affords physical benefits to users. Because its use can be easily mastered, it meets the basic requirement that a toy be fun to use. A preferred embodiment of the invention is a toy which comprises a tubular member formed into a rigid closed loop. The loop has a diameter larger than the widest dimension of the user of the toy. The weight and the diameter of the loop forming the hoop is proportioned so that the hoop may be caused to rotate about the body of a user for relatively long periods of time by co-ordinated movement of the body of the user.

The hoop toy is preferably fabricated from an extruded tubular member which is then formed into a substantially rigid closed loop. The preferred hoop has a friction surface encompassing all or part of the inner periphery of the hoop which contacts the body of the user. The hoop should have a diameter of between 30 and 40 inches, and a weight of between 6 and 12 ounces.

The toy of the invention is used by placing it about one's body and then imparting a spinning motion to the hoop manually. This motion is maintained by suitable body gyrations. The physical benefits are greatest when the hoop is placed at waist level before the spinning motion is commenced. Adept users can maintain the hoop at waist level by either back and forth or side to side movement of the body trunk. The preferred hoop or toy is therefore light in weight so that body motion need not be too extensive.

The transverse diameter of the tube from which the loop of the hoop is made depends largely on the wall thickness of that tubular member. The ratio of mass to loop diameter is an important factor in maintaining the hoop at desired height and in contact with the body of a user. There must be a sufficient effective mass at a sufficient distance from the contact between hoop and user to generate the centrifugal force necessary to maintain the hoop at waist level. Additionally, the hoop preferably has sufficient wall thickness and transverse sectional diameter to be substantially rigid and maintain a substantially planar configuration under the stress of use. To properly combine these characteristics, I have found that an outside tube diameter of 5/8 to 7/8 of an inch, say about 13/16 of an inch, and a weight of 7 to 10 ounces is proper for hoops having an outside diameter of 31 to 37 inches.

Extruded tubing is desirable because it may be economically fabricated in continuous lengths. Also, the preferred exterior friction surface may be created on the tubing at the time that it is extruded, thereby making most economical the manufacture of the basic hoop component. Thus the preferred form of the invention comprises a rigid tubular member of extruded plastic formed into closed loop. The use of plastic gives both economy



and strength. A plug inserted into abutting ends of the looped tubular member joins the ends and maintains the hoop configuration. The diameter of the loop exceeds the girth of the user so that a peripheral portion of the loop diametrically opposite from a peripheral portion in contact with the user is spaced sufficiently from the user so that the hoop may be caused to rotate about the body of the user by suitable movements of the body. The inner surface of the loop defines a continuous circle of substantially uniform diameter.

The friction surface of the preferred hoop comprises continuous grooves extending circumferentially along the periphery of the hoop. The area of the hoop encompassed by the friction surface need be no more extensive than the transverse zone delimited by a 45° arc. However, hoops may be made in accordance with the invention and have an entire surface which is grooved or serrated.

No skilled labor is necessary to make the hoop toy. Its strength requirements are such that relatively inexpensive plastic materials may be used to form the continuous extruded tube from which the hoops are preferably made. These and other advantages of the invention are apparent in the following detailed description and drawing in which:

FIG. 1 is a view of the hoop toy being manipulated by a user;

FIG. 2 is a fragmentary sectional elevation of a hoop toy in accordance with the invention having an elliptical transverse sectional configuration;

FIG. 3 is a fragmentary sectional elevation of an embodiment of the hoop toy in which the friction surface comprises ribs extending from the inner exterior surface of the closed loop;

FIG. 4 is a transverse cross section of a hoop toy in which the entire outer periphery of the toy has a friction surface comprising grooves in the peripheral surface of the toy; and

FIG. 5 is a diagrammatic illustration of the progression of the hoop toy about the waist of a user.

In FIG. 1 a hoop toy **11** is illustrated as rotating about the waist of a user **12**. Proper gyrations of the user's body can maintain a rotating motion of the hoop about the waist. There must be a balance between the gravitational pull downward on the toy and the centrifugal force with which the toy is spun. The tendency of the toy to move downwardly is resisted by a friction surface **13** on the hoop (see FIG. 2). The friction surface tends to increase the frictional bond between the body or clothing of the user and the inner exterior periphery **14** of the hoop. This bond helps resist downward hoop motion.

As shown schematically in FIG. 5, a hoop toy **11A** which is substantially toroidal progresses about a user's waist **12A** shown in dotted lines. Point A represents the tangential contact between the user's waist and the toy. As the toy progresses about the waist the tangential point progresses to points like A' and A''. In order for the hoop toy to be maintained at the waist the centrifugal force (which may be represented as concentrated at point B of the hoop diametrically opposite point A) must be sufficient to combine with the friction between the hoop and the user to resist the gravitational pull downward on the hoop. The centrifugal force is a function of mass and velocity, the distance $D_1$ from points A to B is critical. The average person is not capable of sufficient body motion to impart sufficient velocity to a hoop of much less than 30 inches in diameter. Therefore, the preferred hoop has a diameter greater than 30 inches.

Hoops ranging in outside diameter from 31 to 37 inches and having a weight from 7 to 10 ounces have proved

to be better suited to the intended use than hoops of other diameters and weights.

The extruded plastic tubing from which the hoop toy preferably is made achieves the desired mass when it has an outside diameter of approximately $1\frac{3}{16}$ of an inch and a wall thickness of approximately $\frac{62}{1000}$ of an inch.

In FIG. 2 hoop toy **11**, which is made from an extruded tube **16**, is formed into a closed loop **17** and joined at **18** by a plug **19** inserted into the interior bores of closed loop ends **20** and **21**. Friction surface **13** is made continuous when the two ends of the closed loops are joined. The plug may be fixed within the loop ends by a suitable adhesive or fasteners like staples.

The friction surface of the embodiment illustrated in FIG. 2 comprises a series of continuous parallel grooves **27** impressed in a minor arc of the inner exterior of the hoop. As described with respect to FIG. 1, the friction surface defined by the continuous grooves tends to maintain the hoop toy about the body of the user.

The transverse cross-sectional configuration of the hoop toy may be elliptical as in FIG. 2. The hoop thus has a greater cross-sectional depth in the direction which bears the major strain of hoop rotation. A hoop toy of elliptical transverse cross section still preferably has the relationship between loop diameter and hoop mass as set forth with respect to the description of FIG. 5. The relationship between mass and diameter is important to all of the hoop toys regardless of their transverse cross-sectional configuration, the type of friction surface employed, or whether or not a friction surface is used.

In the embodiment illustrated in FIG. 3 the transverse sectional configuration of the hoop is substantially circular. A hoop toy **33** has a friction surface **35** comprising a multiplicity of raised ribs **37**. Like the embodiments of FIGS. 1 and 2, the hoop toy of FIG. 3 is made from a tubular extrusion. The ribs are therefore continuous. A segment of the tubular extrusion may be formed into a closed loop and joined as described with respect to FIG. 2.

In contrast to the grooves of the embodiment of FIG. 2, the friction surface of the embodiment of FIG. 3 comprises ribs projecting beyond the normal surface of the tubing. These ribs, like the grooves, may still be formed by extrusion techniques and be economically fabricated.

Unlike the embodiments of FIGS. 2 and 3, the hoop toy **40** illustrated in transverse cross section of FIG. 4 has a friction surface **41** which covers substantially the entire area of the hoop. While a friction surface of this extent is not essential to maintaining the hoop toy about the body of a user, such a friction surface whether comprising grooves impressed into the body of the hoop as illustrated in FIG. 4 or comprising ribs raised from the surface as in FIG. 3, obviates the necessity of care in forming the closed loop to insure that the friction surface is oriented throughout its entire length on the inner exterior periphery of the closed loop. The same advantage accrues to hoop toys having no friction surface.

Only three of the many possible friction surfaces have been illustrated and described. Whereas it is preferable that the friction surface comprise continuous grooves or



ribs so that the economy inherent in extruded forming may be taken advantage of, the friction surface may comprise a roughened area of serrations such as achieved by a knurling process, for instance. However, knurling and similar processes are not compatible with the more economical extruding process.

The toy of the invention is economical to manufacture, interesting and fun to use, and if properly used, may result in physical benefits. Its use is not restricted to use about the body of a user, but maximum benefit is derived from such usage.

I claim:

1. A hoop toy especially suited for rotation about a human body in response to the user's body gyrations, comprising a member formed into a closed circular hoop, the member being of rigid tubular plastic and having an outside diameter of about $1\frac{3}{16}$ of an inch so that the hoop as a whole is substantially rigid, the hoop having an outside diameter of approximately 31 to 37 inches and having a total weight of approximately 7 to 10 ounces, so that a portion of the hoop diametrically opposite from a hoop portion in contact with the user's body is spaced from the user's body a sufficient distance to co-act with the weight of the hoop to cause the hoop by virtue of its being substantially rigid to rotate about the user in response to the user's body movements.

2. Apparatus of claim 1 wherein the tubular member forming the hoop has a wall thickness of approximately $\frac{62}{1000}$ inch.

3. A hoop toy especially suited for rotation about a human body in response to the user's body gyrations, comprising a member formed into a closed circular hoop, the member being of rigid tubular plastic and having an outside diameter of about $1\frac{3}{16}$ of an inch so that the hoop as a whole is substantially rigid, the hoop having an outside diameter of approximately 30 to 40 inches and having a total weight of approximately 6 to 12 ounces, so that a portion of the hoop diametrically opposite from a hoop portion in contact with the user's body is spaced from the user's body a sufficient distance to co-act with the weight of the hoop to cause the hoop by virtue of its being substantially rigid to rotate about the user in response to the user's body movements.


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