

[54] **MOBILE GEOMETRICAL FORM**

[76] Inventor: **Francis Rebajes**, San Miguel, 45,
Torremolinos-Malaga, Spain

[22] Filed: **Dec. 26, 1973**

[21] Appl. No.: **428,201**

[52] U.S. Cl. **272/8 R; 35/73; D34/15 A;**
272/57 R; 428/12; 428/28; 428/542

[51] Int. Cl. **D04d 9/04**

[58] Field of Search **161/7; D34/15 A; 35/73;**
46/23, 24

[56] **References Cited**

UNITED STATES PATENTS

3,450,592	6/1969	Conrad et al.	161/7
3,492,191	1/1970	Van Horn	161/7
3,660,213	5/1972	Mosely	161/7

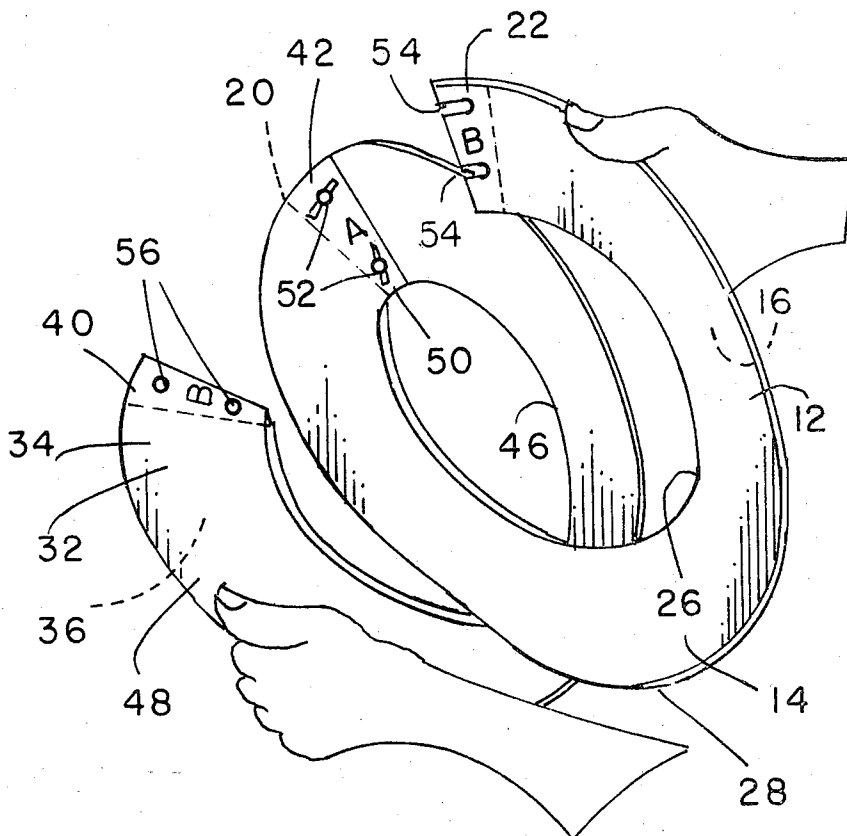
Primary Examiner—William E. Schulz

Attorney, Agent, or Firm—Friedman & Goodman

[57] **ABSTRACT**

A mobile geometrical form in the general shape of a hyperbolic paraboloid is described as made from a continuous strip of material to form a continuously twisted shape having both an external edge and an internal edge. The internal edge of the form defines an opening centrally in the form. The form has two distinct continuous surfaces on opposing sides of the strip from which the form is made. Each side or surface has four lines of inflection to result in four surface portions having successive concave and convex contours. Opposing surface portions of the strip between the same inflection lines have opposing concave and convex contours. The form is made of a semi-rigid flexible material such as sheet metal. In this manner, the strip can assume the predetermined geometrical form in an infinite number of relative positions of the strip. The stresses established in the strip redistribute themselves in each relative position of the strip as the latter translates along a path generally defined by the form itself to maintain the shape of the same.

22 Claims, 19 Drawing Figures



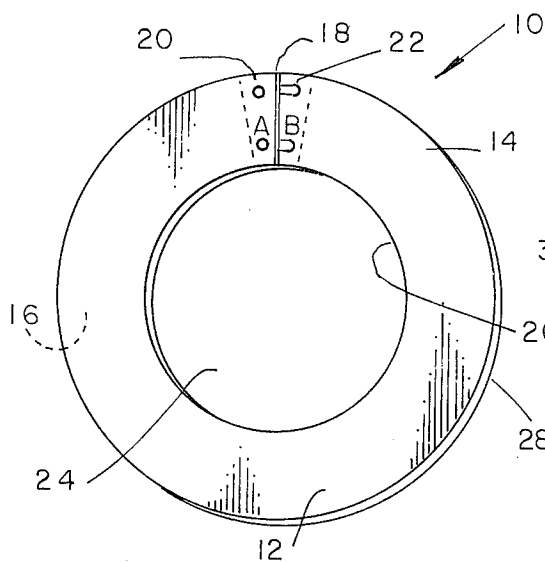


FIG. 1

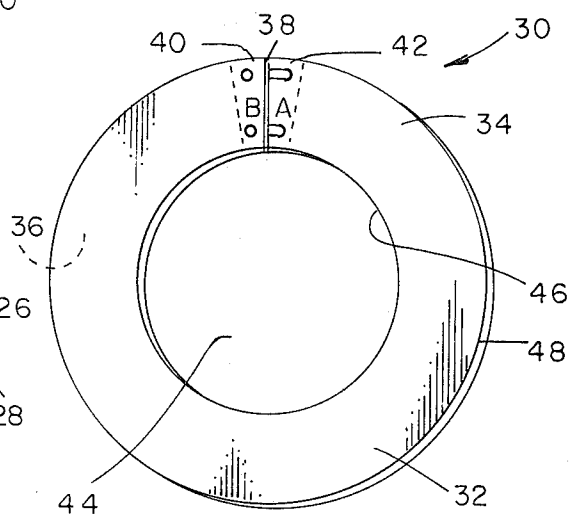


FIG. 2

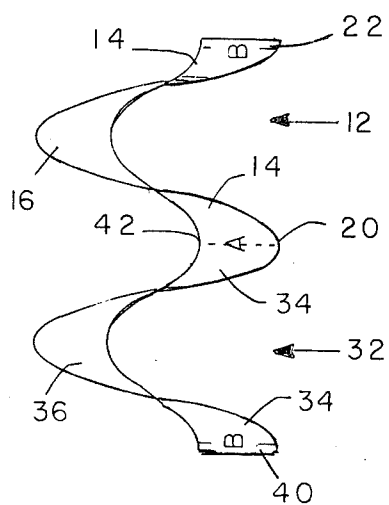


FIG. 3

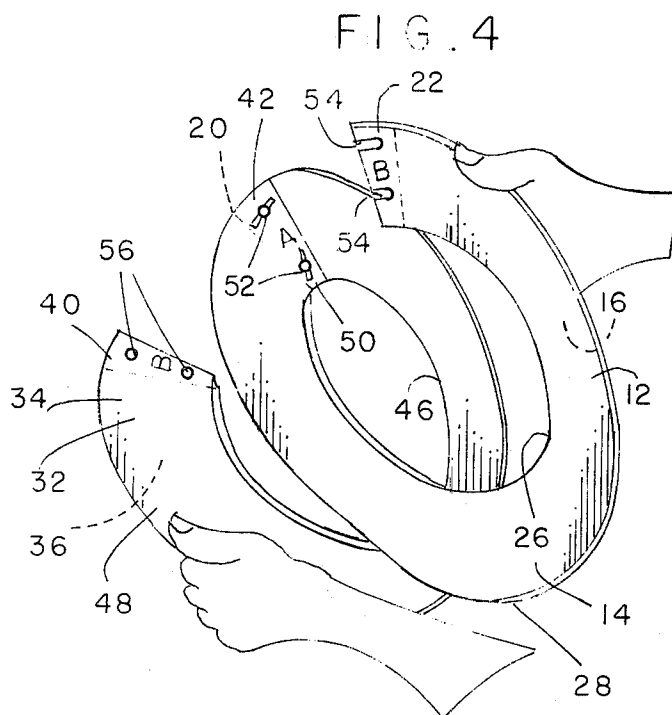


FIG. 6

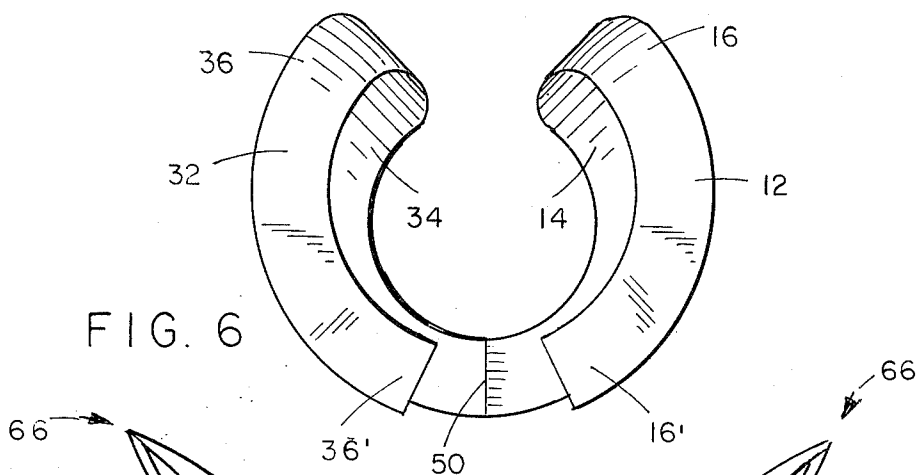


FIG. 8

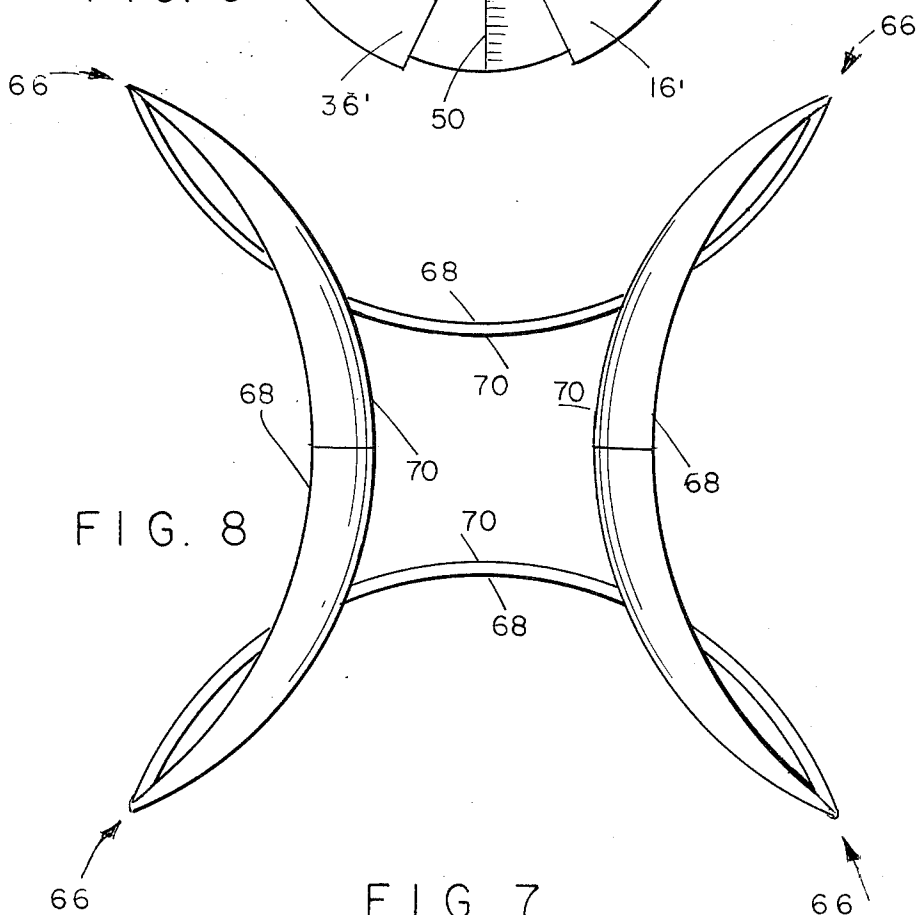


FIG. 7

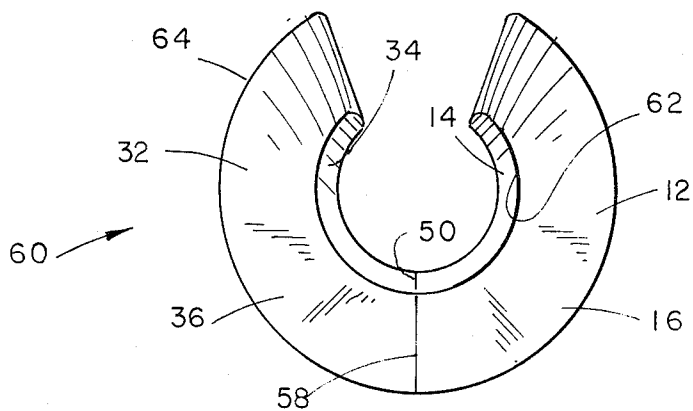


FIG. 5

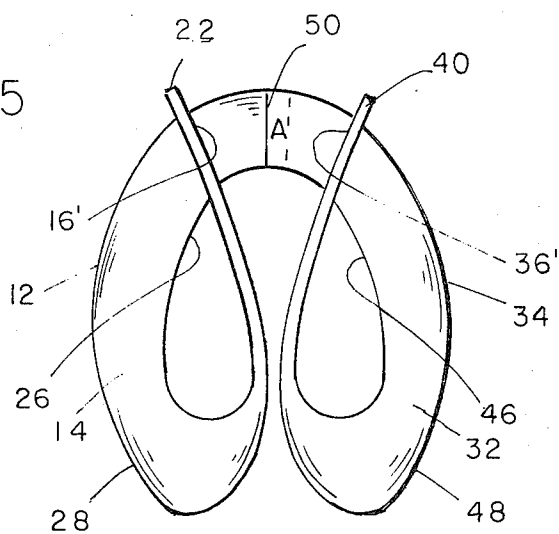


FIG. 9

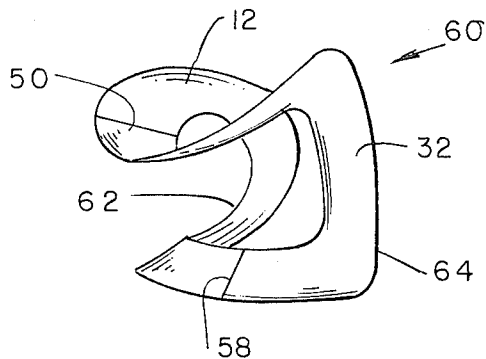
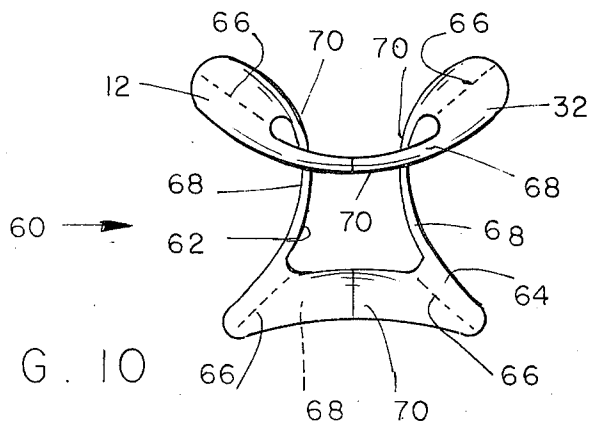


FIG. 10



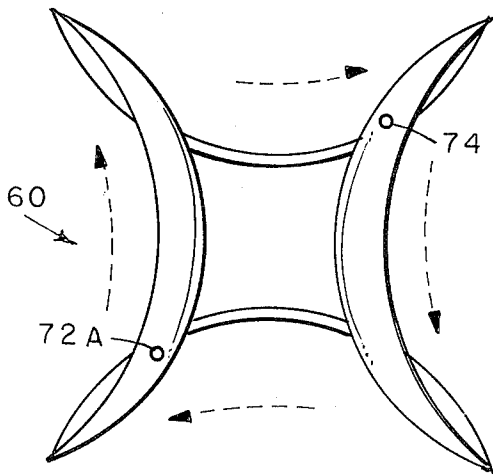


FIG. 11

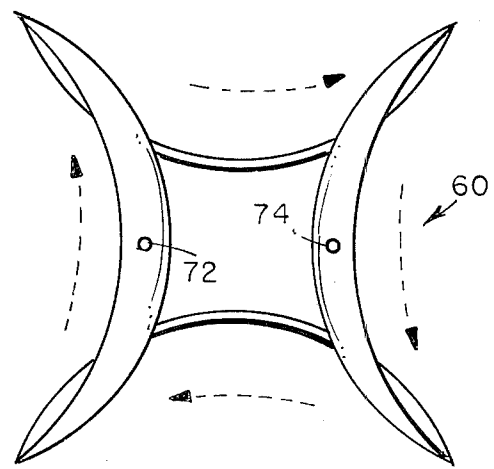


FIG. 12

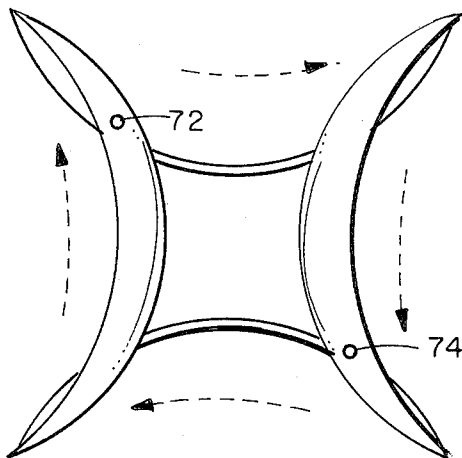


FIG. 13

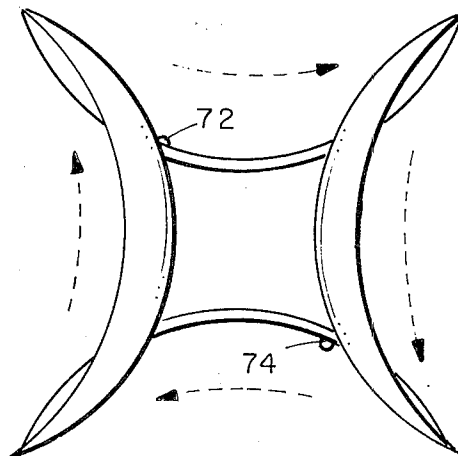


FIG. 14

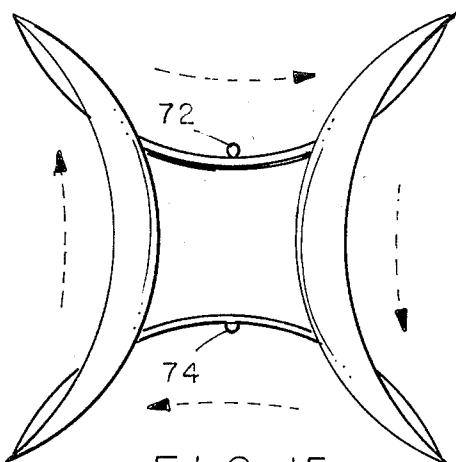


FIG. 15

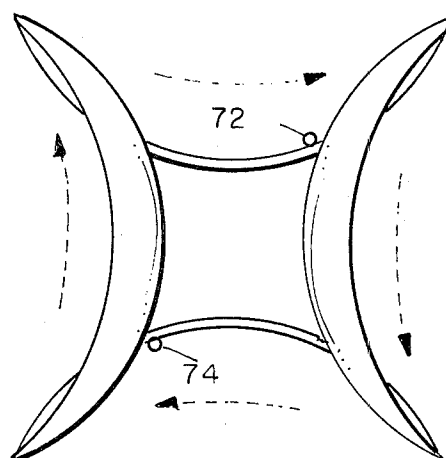


FIG. 16

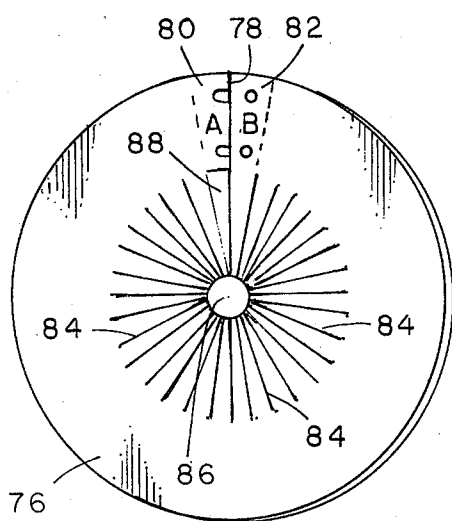


FIG. 17

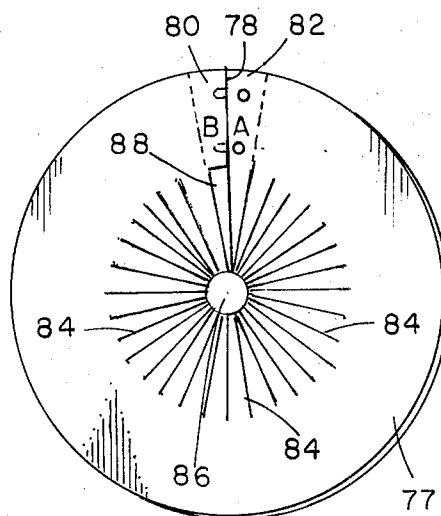
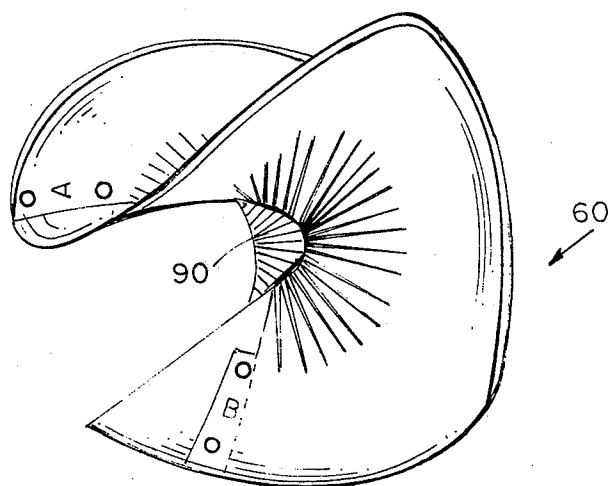


FIG. 18

FIG. 19



MOBILE GEOMETRICAL FORM

BACKGROUND OF THE INVENTION

Various geometrical forms are known. Some of these forms are found in the fields of structural architecture, abstract art, complex machine parts including cams and followers and home display or decorative objects. However, the present invention discloses a novel geometrical form which has unique characteristics which makes the same suitable for being adapted for many varied uses.

The mobile geometrical form of the present invention, which is in the general shape of a hyperbolic paraboloid, is made of a semi-rigid flexible material. Once the form is established, in accordance with the method to be described, the strip assumes the novel geometrical form in an infinite number of relative positions of the strip. Translatory motion of the strip, within a general path outlined by the form, redistributes the stresses established in the strip in each position of the latter to maintain the shape of the geometrical form. The forces required to translate the strip within its general outline or shape are a function of the flexibility of the material from which it is made and can be reduced to minimal values.

Accordingly, the novel and aesthetically pleasing form of the present invention can be utilized both for ornamental purposes as well as other mechanical utilitarian purposes. For example, the form is particularly suitable as a reciprocating movement or motion device. Also, the novel form can be utilized to convert linear into curvilinear movements or vice versa. Other important uses of the device include amusement and exercise. For example, as will become evident from the description that follows, the form can be continuously or reciprocally advanced while continuously maintaining a fixed grip on two points of the form. This suggests possible use in physical therapy applications to provide exercise to muscles in the arms and wrists.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a novel geometrical form which exhibits new and unusual properties not known heretofore in prior art geometrical forms.

It is another object of the present invention to provide a novel and useful geometrical form which is simple in construction and economical to manufacture.

It is still another object of the present invention to provide a novel geometrical form which is made of a continuous strip of semi-rigid flexible material and which can be either continuously or reciprocally translated along a path generally defined by the novel shape.

It is yet another object of the present invention to provide a mobile geometrical form which is in the general shape of a hyperbolic paraboloid but having an internal edge forming an opening centrally of the form and which is made of a continuous strip of material.

It is a further object of the present invention to provide a mobile geometrical form of the type above suggested which can be utilized for ornamental as well as mechanically utilitarian purposes.

It is still a further object of the present invention to provide a mobile geometrical form of the type generally under discussion which can translate linear into curvilinear motion and vice versa.

It is yet a further object of the present invention to provide a mobile geometrical form as suggested in the above objects which can be utilized both for amusement and exercise purposes.

It is an additional object of the present invention to provide a method for easily assembling and forming the mobile geometrical form above described.

In order to achieve the above objects, as well as others which will become apparent hereafter, a mobile geometrical form in accordance with the present invention comprises a double-sided continuous strip of material, each side having four points of inflection to thereby result in four surface portions having excessive concave and convex contours. Opposing surface portions of said strip between the same inflection points have opposing concave and convex contours. The double-sided continuous strip of material is twisted to cause each surface to include two portions thereof which substantially face each other and two portions which are substantially directed away from one another, the portions facing each other and the portions directed in opposing directions being symmetrically disposed about and substantially parallel to respective planes which are normal to one another. Generally, the novel mobile geometrical form of the present invention is in the form of a hyperbolic paraboloid which, when formed from a continuous strip of material, exhibits both an external edge and in internal edge, with the internal edge forming an opening centrally of the form.

Advantageously, the strip of material is made from a semi-rigid flexible material. In this manner, the strip assumes the geometrical form in an infinite number of relative positions of the strip. The stresses established in the strip redistribute themselves in each relative position of the strip to maintain the shape of the geometrical form.

According to some presently preferred embodiments, the external and internal edges of the form are smooth. However, protuberances in the form of projections may be provided on the internal, external or both edges. With such protuberances, the mobile geometrical form adds extra dimensions for possible uses to which it can be applied. As suggested above, such a geometrical form can be utilized for ornamental, amusement, exercising, and mechanical uses.

BRIEF DESCRIPTION OF THE DRAWINGS

With the above and additional objects and advantages in view, as will hereinafter appear, this invention comprises the devices, combinations and arrangements of parts hereinafter described and illustrated in the accompanying drawings of a preferred embodiment in which:

FIGS. 1 and 2 are top plan views of slitted annular strips from which the mobile geometrical form in accordance with the present invention may be formed;

FIG. 3 is a side elevational view of the two annular strips shown in FIG. 1 when the strips are concentrically disposed and opposing edges are joined to permit the connected annular strips or resultant strip to be stretched along the general direction of the axis into the general shape of a helicoid;

FIG. 4 is a perspective view of the helicoid shown in FIG. 3, showing the manner in which the helicoid is formed by separation of the free ends of the respective annular strips;

FIG. 5 is a front elevational view of the connected strips after one of the free ends of the resultant strip is bent to bring portions of one of the resulting surfaces of the helicoid onto itself whereby portions of a single surface face each other;

FIG. 6 is similar to FIG. 5, showing the condition when one of the free ends has been brought adjacently to the other free end and wherein the free ends are aligned to bring the corresponding surfaces at the free ends to positions generally facing the same direction;

FIG. 7 is similar to FIG. 6, showing the condition when the free ends are joined to each other to thereby cause each of the original helicoid surfaces to form a continuous surface once all the opposing edges have been connected;

FIG. 8 is a front elevational view of the novel geometrical form resulting from the above suggested and illustrated construction, the form being generally in the shape of a hyperbolic paraboloid which defines an external edge and an internal edge, with the internal edge forming an opening centrally of the form;

FIGS. 9 and 10 are perspective views of the geometrical form shown in FIG. 8, taken from different angles to clearly illustrate the novel form;

FIGS. 11-16 are front elevational views similar to FIG. 8, each view showing two points at slightly translated positions, the FIGURES showing the manner in which the form of the present invention permits, when made of a semi-rigid flexible material, translation or movement of the strip along a path generally defined by the extent of the latter. The strip may thus assume an infinite number of relative positions with the stresses established in the strip redistributing themselves in each relative position to maintain the shape of the geometrical form. While FIGS. 11-16 illustrate translatable movement of the strip to thereby result in all points on the strip moving, it is also possible to fix one point on the strip. When one point on the strip is fixed, movement of the type suggested in FIGS. 11-16 causes the geometrical form to reciprocate from side to side about the fixed point while including curvilinear nutating-type movement;

FIGS. 17 and 18 are similar to FIGS. 1 and 2, but showing a plurality of projections along the length of the internal edge extending in the direction generally centrally of the annular discs; and

FIG. 19 is a perspective view of a second embodiment of a mobile geometrical form in accordance with the present invention made from the discs shown in FIGS. 17 and 18.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the FIGURES, in which identical or similar parts have been designated by the same reference numerals throughout, and first referring to FIGS. 1 and 2, the mobile geometrical form in accordance with the present invention will be described as being formed of two slitted annular strips 10 and 30. While the description will be outlined in the order in which the strips are assembled to ultimately form the novel form or shape, it is pointed out that the same or similar form need not be formed from two individual strips but may be molded or constructed from a single continuous strip.

The annular strip 10 includes a disc 12 having an upper surface 14 and a lower surface 16, as viewed in

FIG. 1. The disc 12 is provided with a slit 18 to form an end portion 20, marked with an A, and an opposing end portion 22, marked with a B.

Similarly, the annular strip 30 includes a disc 32 having an upper surface 34 and a lower surface 36, as viewed in FIG. 2. The disc 32 is provided with a slit 38 to thereby form opposing end portions 40 and 42, respectively designated by the letters B and A.

The annular strip 10 is provided with a central opening 24. In the presently preferred embodiment, the central opening 24 is defined by a smooth internal edge 26. The external periphery or edge contour is defined by a smooth edge 28. To facilitate the description of the novel geometrical form and the principle which makes it possible, the internal and external edges 26 are shown as simple concentric circular edges. Modifications of the internal and external edges will be more fully described in connection with FIGS. 17-19.

Similarly, the annular strip 30 is provided with a central opening 44 defined by a circular smooth internal edge 46. The external circular edge 48 is concentric with the internal edge 46 and is similarly smooth.

The upper sides or surfaces 14 and 34, as well as the lower surfaces 16 and 36 are so defined for facilitating the description of the invention. These surfaces have no other significance and, clearly, inversion of the discs would reverse the roles of the described surfaces.

With the annular strips disposed as shown in FIGS. 1 and 2, it is pointed out that the end portion 20, shown to the left of the slit 18 in FIG. 1, is designated by the letter A. On the other hand, the end portion 40, to the left of the slit 38, is designated by the letter B. Similarly, the end portions 22 and 42, respectively to the right of slits 18 and 38, are respectively marked by the letters B and A.

The first step in assembling the annular strips 10 and 30 is to dispose the strips one on top of the other in a concentric fashion whereby the discs 12 and 32 overlap with the slits 18 and 38 aligned. In this condition, the end portion 20 is disposed contiguous to the end portion 40 while the end portion 22 is contiguous to the end portion 42. An end portion to the right of the slit of one of the strips is now joined to an end portion to the left of a respective slit on the other strip. Thus, either the end portion 20 may be joined to the end portion 42 or the end portion 22 may be joined to the end portion 40. The particular set of end portions which are connected in this manner is not critical and the same ultimate results are obtained, as will become evident hereafter. As suggested in FIGS. 3 and 4, the end portions 20 and 42 have been joined in the example presently being described. The joint 50 may be formed by connecting the end portions 20 and 42 in any conventional means, such as with screws and wing nuts 52.

The resulting form is generally described as a right helicoid when the remaining free end portions 22 and 40 are separated from each other or the resulting strip is stretched generally along the axis of symmetry.

In FIG. 4, the resulting helicoid is shown when the end portions 22 and 40 are moved in opposing directions. It should be noted that the effect of joining the two annular strips 10 and 30 in this fashion causes the upper surfaces 14 and 34 to merge and define a continuous helical surface. Similarly, the lower surfaces 16 and 36 of the respective annular strips 10 and 30 similarly merge to form a helical surface. Thus, the upper surfaces 14 and 34 generally face a single direction

along the axis of the resulting helicoid while the lower surfaces 16 and 36 similarly face a single opposing direction along the axis.

Also shown in FIG. 4 are cutout portions 54 at the end portion 22 while bolts 56 are shown projecting from the end portion 40 which are adapted to be received within the cutout portions 54 when the free ends of the helicoid are joined in a manner to be described hereafter.

As suggested above, the annular strips 10 and 30 are made of a semi-rigid flexible material. This material may either be sheet metal or a sheet of elastomeric plastic material. The thickness and hardness of the annular strips will determine the ease with which the resulting geometrical form can be shifted or translated along itself, as will become evident hereafter.

Referring to FIG. 5, the next step in the assembly of the construction of the form is the bending of one free end of the resulting spiral or helicoid shown in FIG. 3 to cause, in the example shown in FIG. 5, lower surface portions 16' and 36' to face each other. The configuration shown in FIG. 5 is achieved by bending the disc 32 at the end portion 40 inwardly or towards the end portions 20 and 42 and bringing the lower surface 36 in the region of the end portion 40 to a facing condition with respect to the lower surface 16 of the disc 12. Once the disc 32 has been so deformed, the end portion 40 is continuously moved along the lower surface 16 in a generally counter-clockwise direction, as viewed in FIG. 4, until the end portion 40 is disposed adjacent to the end portion 22.

The transformation between the shapes shown in FIGS. 5 and 6 are effected by twisting the resulting end portions 22 and 40 towards each other to dispose the lower surface portions 16' and 36' in a common plane. The free ends and end portions 22 and 40 are then aligned to dispose the edges at the free end portions co-extensively with one another and cause the upper surfaces 14 and 34 and lower surfaces 16 and 36 at the free end portions to generally face the same directions.

The final step of the construction process is the joining of the free ends to each other at a second joint 58, shown in FIG. 7. The resulting mobile shape or form is generally designated by the reference numeral 60. It will be noted that the form 60 merges the original upper surfaces 14 and 34 into a continuous surface. Similarly, the original lower surfaces 16 and 36 of the component annular strips are similarly merged into a continuous surface.

It is also noted that the novel mobile form 60 now includes an internal edge 62 which represents the original internal edges 26 and 46 which merge when the annular strips are joined as described. Similarly, a new continuous external edge 64 is defined by the form 60 which replaces the original external edges 28 and 48 of the two component strips. The above described continuous edges and surfaces are shown in FIGS. 7 and 9.

The novel mobile shape or form 60 defines an interesting mathematical warped surface resembling, in certain respects, the doubly ruled hyperbolic paraboloid. However, it should be noted that the hyperbolic paraboloid is formed of a solid warped or deformed planar sheet. On the other hand, the form 60 of the present invention is in the form of a continuous warped strip having a finite width. For this reason, an internal edge 62 is defined which forms a central opening exhibited by the form 60. It is the provision of the internal edge 62,

and the central opening which it represents, which substantially increases the versatility of the form 60 since this permits the translatable and reciprocating movements which have been suggested above and which will be further described hereafter in connection with FIGS. 11-16.

An interesting characteristic of the novel form 60 is its ability to maintain the shape shown in the FIGURES even though the form may be made from a semi-rigid flexible material. The tendency for the form 60 to maintain its shape exists even when limited external forces are applied to the form. In this connection, reference is had to FIGS. 8 and 10 wherein the mobile form 60 is viewed at a particular instance of time. In the configuration shown, the form 60 exhibits four lines of inflection 66. These lines are inflection separate or divide each of the surfaces, i.e., the original merged lower surfaces or the original merged upper surfaces, into four surface portions each having successive concave and convex contours. Clearly, opposing surface portions of the resulting strip between the same inflection lines have opposing concave and convex contours. The concave surfaces or contours are designated by the reference numeral 68 while the convex surfaces or contours are designated by the reference numeral 70. In this connection, the form 60 can be described as a continuous strip of material which is twisted in such a manner to cause each continuous looped surface to include two portions thereof which substantially face each other and two portions which are substantially directed away from one another. The portions which face each other and the portions directed in opposing directions being symmetrically disposed about and substantially parallel to respective planes which are normal to one another. In the example illustrated in FIG. 10, the surface portions which face each other are always the convex surfaces 70 while the surface portions which are directed away from each other are always the concave surfaces.

The lines of inflection 66 which are exhibited in the form 60 are caused by and represent a distribution of stresses within the resulting continuous strip which tends to maintain the strip in the shape shown in FIGS. 8-16. However, referring to FIGS. 11-16, it will become clear that the strip may assume the same geometrical form in an infinite number of relative positions of the strip. In each case, the stresses established in the strip redistribute themselves in each relative position of the strip to maintain its shape of the geometrical form 60. In this sense, the restoring forces at any single point on the continuous loop tend to revert that portion into the planes of the original flat annular strips 10 and 30. It is these restoring forces which maintain the curved or warped condition of the form 60 in a state of equilibrium or stability.

The mobility or ability of the form 60 to move or translate along itself is based on the semi-rigid characteristic of the resulting strip, the central opening defined by the internal edge 62 and the ability of the resulting shape to reach a stable equilibrium and distribution of stresses which tend to maintain the strip in the desired shape or form. Referring to FIGS. 11-16, the resulting form 60 is shown in each FIGURE with markings 72 and 74. The markings 72 and 74 are provided on the strip to indicate fixed points on the strip to illustrate the translatable movement of which the present form 60 is capable of achieving. To best understand this type of movement, it may be helpful to imagine an

imaginary continuous path or corridor which is flat and shaped to receive internally thereof the form 60. If such a shaped path or guide corridor could be imagined, the translatory motion which is illustrated in FIGS. 11-16 is comparable to the constant advancement of each point on the continuous strip of the form within the imaginary guide path or corridor. Stated otherwise, the movement illustrated in the FIGURES is such that each fixed point on the resulting form 60 can continuously move along a path generally defined by the form itself. Thus, the point 72 is shown in the lower left corner in FIGURE 11 while the marking 74 is in the upper right corner. However, with sliding or translatory motion of the entire strip in the direction indicated by the dashed arrows, the point or marking 72 is advanced towards the middle left while the marking 74 is moved towards the middle right of the form. With continued movement of the resulting strip in the direction of the dashed arrows, the points 72 and 74 ultimately move to the rear of the form in FIG. 14 and continue to advance to positions shown in FIG. 16. A FIGURE subsequent to FIG. 16 would appear similar to FIG. 11 wherein the point A has moved from the rear onto the upper right corner of the form and the marking 74 from the rear to the lower left corner of the form as shown in FIG. 11. It is pointed out in connection with FIGS. 11-16 that the translatory motion there shown results when every point of the form is moved relative to a fixed point externally of the form. It is for this reason that the strip is permitted to advance while the overall form appears to be stationary, with the exception to the reference to markings 72 and 74.

A substantially different effect is observed when the translatory motion above described is applied to a form 60 which is fixed at one point thereof. When this is done, the form exhibits the above translatory motion, but additionally reciprocates from side to side about the fixed point in a cyclical motion not unlike a nutating motion.

Uses of the form 60 are numerous. In addition to ornamental, artistic and amusement devices or objects, the present invention exhibits properties which are useful in mechanical arrangements. The translatory motion described in connection with FIGS. 11-16 may be utilized in a camming action. With one point fixed, a reciprocating motion can be achieved which exhibits both linear as well as curvilinear components. As described above, the fixing of one point causes the form 60 to reciprocate from side to side about the fixed point, this being a useful feature in some forms of machines. In this connection, the reciprocatory motion may be mechanized by alternating applying opposing forces to the continuous strip proximate or adjacent to the fixed point. The frequency of reciprocation then corresponds to the frequency at which the opposing forces are applied to the portions of the strip adjacent to the fixed point.

While the above described forms exhibit smooth internal and external edges, it is pointed out that projections of various shapes can be provided along these edges. Referring to FIGS. 17 and 18, discs 76 and 77 are shown which are similar to the discs 12 and 32 shown in FIGS. 1 and 2. The discs 76 and 77 are each provided with slits 78 and opposing end portions 80 and 82. Each of the discs is provided with a plurality of equally angularly spaced radial slits 84 which together define central openings or holes 86. In order to prevent

the overlap of two triangular projections when the discs are assembled, a space 88 is provided on each disc which permits the overlapping of the end portions 80 and 82 without resulting in an overlap of triangular projections or extensions.

The procedure for assembling the discs 76 and 77 is identical to that described in connection with discs 12 and 32. The resulting form is designated by the reference numeral 60' shown in FIG. 19. Clearly, the forms are very similar, with the exception that the form 60' includes a plurality of triangular projections which project centrally into the form. The ends or tips of each of the projections together define a square-like opening 90. The mobile property of the form 60' are similar to those described in connection with the form 60.

Likewise, while the external edge 64 of the form 60 has been shown and described as being smooth, suitable protuberances or projections may similarly be provided along the external edge 64. Such projections generally extend in a direction away from the central region of the form. According to one embodiment of the present invention, the external edge 64 has a predetermined length. In this embodiment, two extensions are provided at points along the predetermined length to form therebetween two equal length portions. Each extension extends in a direction substantially normal to the external edge portion from which it projects and each extension is provided with a surface at the free end thereof which is substantially parallel to the respective external edge portion. The form 60 is supportable on the two end surfaces when the extensions, in the form of legs, are disposed adjacently to one another in opposing relation. As suggested above, when one of these extensions or legs is fixed in space relative to the other extension, the other projection is movable between two positions. In one position, the extensions are disposed in adjacent, substantially parallel and opposing positions. In the other position, the surfaces of the extensions, which faced each other in the first or initial position, face away from each other in the other or second position. By successively fixing each of the legs or extensions, the form can be advanced along a linear direction.

It will thus be noted from the above description that the novel geometrical form of the present invention can exhibit various forms of motion while it does not have any moving parts.

While reference has been made throughout to annular strips, it is pointed out that this phrase is not intended to be limited to circular annular strips, as suggested, for example, in FIGS. 1 and 2. The term annular strip in the context of the present description and claims is intended to include any flat sheet of arbitrary peripheral or edge contours or outlines. This may include square, triangular or any shaped sheets. Each sheet, irrespective to its outside contour or edge configuration is provided with an internal opening, which may again assume an arbitrary shape. The internal opening may be disposed anywhere within the external edge boundaries, not necessarily centrally located. The slits above described now extend between an internal and external edge boundary.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of the inven-

tion which is for purposes of illustration only and is not to be construed as a limitation of the invention.

What is claimed is:

1. A mobile geometrical form comprising a double-sided continuous strip of material, each side having four points of inflection to thereby result in four surface portions having successive concave and convex contours, opposing surface portions of said strip between the same inflection points having opposing concave and convex contours.

2. A mobile geometrical form as defined in claim 1, wherein said strip of material is made of a semi-rigid flexible material, said strip assuming the geometrical form in an infinite number of relative positions of said strip, the stresses established in said strip redistributing themselves in each relative position of said strip to maintain the shape of the geometrical form.

3. A mobile geometrical form as defined in claim 2, wherein said material is a sheet of metal.

4. A mobile geometrical form as defined in claim 2, wherein said material is a sheet of elastomeric plastic.

5. A mobile geometrical form comprising a double-sided continuous strip of material, said strip being twisted to cause each surface to include two portions thereof which substantially face each other and two portions which are substantially directed away from one another, said portions facing each other and said portions directed in opposing directions being symmetrically disposed about and substantially parallel to respective planes which are normal to one another.

6. A mobile geometrical form as defined in claim 5, wherein said strip of material is made of a semi-rigid flexible material, said strip assuming the geometrical form in an infinite number of relative positions of said strip, the stresses established in said strip redistributing themselves in each relative position of said strip to maintain the shape of the geometrical form.

7. A mobile geometrical form as defined in claim 6, wherein said material is a sheet of metal.

8. A mobile geometrical form as defined in claim 6, wherein said material is a sheet of elastomeric plastic.

9. A mobile geometrical form in the general shape of a hyperbolic paraboloid, said form comprising a continuous strip of material to thereby form both an external edge and an internal edge, said internal edge forming an opening centrally of said form.

10. A mobile geometrical form as defined in claim 9, wherein said internal edge is smooth.

11. A mobile geometrical form as defined in claim 9, wherein said internal edge is smooth and includes at least one extension extending in a direction generally centrally of the form.

12. A mobile geometrical form as defined in claim 11, wherein a plurality of extensions are provided along the length of said internal edge each extending in a direction generally centrally of the form.

13. A mobile geometrical form as defined in claim 12, wherein said extensions are triangular.

14. A mobile geometrical form as defined in claim 9, wherein said external edge is smooth.

15. A mobile geometrical form as defined in claim 9, wherein said external edge is smooth and includes at least one extension extending generally away from the central region of the form.

16. A mobile geometrical form as defined in claim 15, wherein a plurality of extensions are provided each

extending in a direction generally away from the central region of the form.

17. A mobile geometrical form as defined in claim 16, wherein said strip is made of a semi-rigid flexible material, said strip assuming the geometrical form in an infinite relative positions of said strip, the stresses established in said strip redistributing themselves in each relative position of said strip to maintain the shape of the geometrical form.

18. A mobile geometrical form as defined in claim 17, wherein said external edge has a predetermined length, and wherein two extensions are provided at points along said predetermined length to form therebetween two equal length portions.

19. A mobile geometrical form as defined in claim 18, wherein each extension extends in a direction substantially normal to the external edge portion from which it projects, each extension being provided with a surface at the free end thereof which is substantially parallel to the respective external edge portion, the form being supportable on said end surfaces when said extensions are disposed adjacently to one another in opposing relation.

20. A mobile geometrical form as defined in claim 18, wherein one of said extensions is fixed in space relative to the other extension, the other extension being movable between two positions, one position wherein said extensions are disposed in adjacent substantially parallel and opposing positions, and another position wherein the surfaces of said extensions which face each other in said one of said positions facing away from each in the other of said positions.

21. A mobile geometrical shape formed by two concentric annular strips each having first and second opposite surfaces respectively facing the same direction and each having adjacent first and second opposing edges, with respective first and second edges of each of said strips being disposed adjacently to each other, and a first edge of one strip being connected to a second edge of the other strip to result in a spiral wherein said first surfaces and second surfaces of each said strips respectively merge, one of the free ends of said strips being bent to bring portions of one of said surfaces into a facing condition, said one of the free ends being brought adjacently to the other free end and said free ends being twisted and joined to cause said first and second surfaces to respectively merge, whereby both said first and second surfaces become continuous when all said opposing edges have been joined.

22. A method of forming a mobile geometrical shape comprising the steps of

A. Disposing two slotted annular strips concentrically to each other, each of said strips having first and second opposing surfaces respectively facing the same directions and first and second opposing edges;

B. Connecting a first edge of one strip with a second edge of the other strip to cause said first and second surfaces to merge at the point of connection, the resulting shape being a spiral having said first surfaces generally facing one direction and said second surfaces generally facing an opposing direction;

C. Bending one free end of the resulting spiral to cause portions of one of said surfaces to face each other;

11

- D. Bringing said edges at the free ends of the spiral into proximity to each other;
- E. Aligning the free ends and opposing edges to bring corresponding first and second surfaces at the free ends to positions generally facing the same direction; and

12

- F. Joining said free ends to each other, whereby said first and second surfaces each form a continuous loop when all the opposing edges have been connected.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65