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A reusable closure for a container

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ABSTRACT

A reusable closure (20) for an open topped container (21), the container having a side wall (23) and a top opening defined by a rim (27). The closure (20) has a cover (22) that includes a peripheral channel (25) which engages over the container rim (27). Securing lugs (28) are pivotally attached to an outer wall (26) of the channel (25) and a locking ring (36) is slideable downwardly to press the securing lugs (28) inwardly against the container side wall (23) to secure the closure (20) onto the container (21). The securing lugs (28) include beads (40) for engaging a complementary groove (41) in the container side wall. The locking ring (36) is slideable upwardly to release the securing lugs (28), which spring outwardly to their normal as moulded position. The closure (20) is readily applicable to a container to re-seal it and is readily removable by a consumer. [Fig. 5].

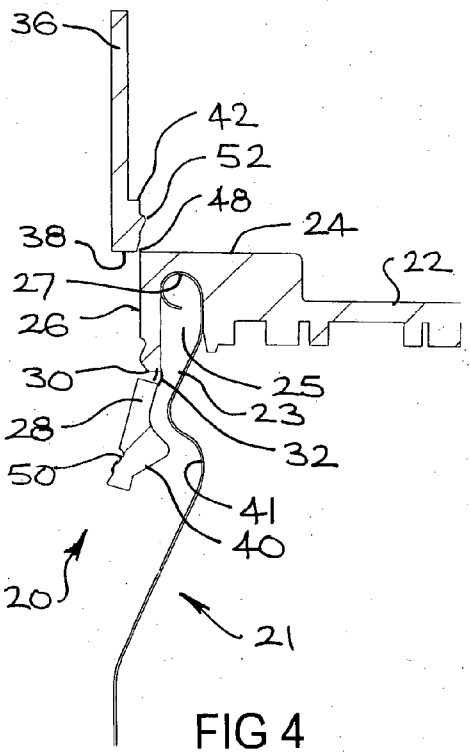

FIG 4

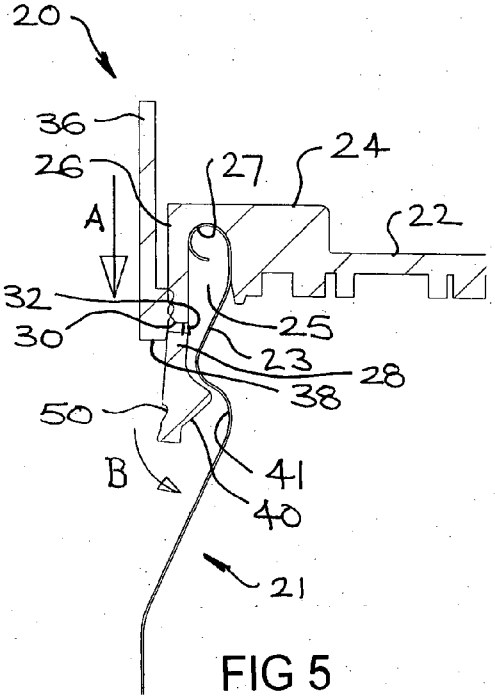

FIG 5

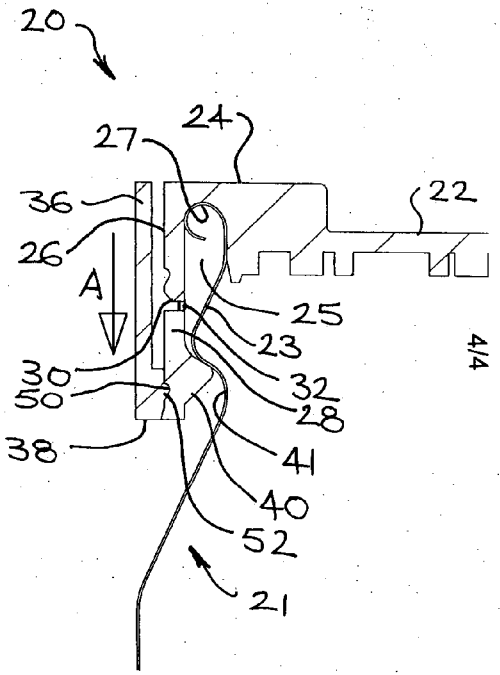

FIG 6

P/00/009A
Section 29

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INNOVATION PATENT SPECIFICATION

Invention Title: A REUSABLE CLOSURE FOR A CONTAINER

Applicant: NCI HOLDINGS PTY LTD

The invention is described in the following statement:

A REUSABLE CLOSURE FOR A CONTAINER

Technical Field

The present invention relates to a reusable closure for an open topped container. The container with which the closure is usable comprises a side wall and has a top opening which is defined by a rim. The invention will be described herein in relation to a closure for a container such as a can for containing a liquid such as paint, however it is to be understood the closure may be used for other types of containers for containing other types of products, usually liquids.

Background

It is often desired by consumers that a container of product, for example a can of paint, after first being opened, be re-closable with the container closure or lid. This is particularly so for cans having a capacity such that all of the paint in the can is not used at the one time. Thus the can needs to be resealed to preserve the remaining paint for use at a later time.

It is also desirable for consumer acceptance that the closure be relatively easily removable and re-applicable to the container. Use of plastic lids is known, however such lids need to have some flexibility to allow for them to be manipulated, for example stretched, for removal from and re-application to the container. Nevertheless, given the requirement for structural strength of plastic closures (for example for stacking), such closures tend still to require a reasonably large effort and/or the aid of a tool to obtain mechanical advantage to pry them off the container. Another problem due to the flexibility of such plastic closures is that dry material on the inside surface of the closure tends to come off and fall back into the container body. This is a particular problem for cans of paint in that dried flakes of paint can fall into the paint in the container and cause blockages in paint spray guns. This problem may occur during transport of a container as well as during application or removal of its closure.

Disclosure of The Invention

According to a first aspect of the invention there is provided a re-usable closure for an open topped container wherein the container has a side wall and a top opening that is defined by a rim,

the closure including a cover having a peripheral structure for engaging the container rim, the peripheral structure including an outer wall for surrounding the side wall of the container,

the cover further including at least two spaced securing lugs that depend from the outer wall and are pivotally moveable towards and away from the container side wall,

the closure also including a locking element surrounding the outer wall and moveable thereover and over the depending securing lugs to press the securing lugs inwardly against the container side wall thereby securing the closure on the container,

wherein the locking element is oppositely moveable to release the securing lugs.

Preferably each securing lug has a normal position whereat it is angled away from the side wall of the container.

A closure according to the first aspect of the invention provides an arrangement for readily releasing the securement of the closure on a container, thereby allowing easy removal of the closure, and for readily re-securing the closure onto the container, for example to re-seal the closure thereon. This arrangement involves a consumer merely moving the locking element upward and downward for example. Also the closure is readily applied in the first instance by a packager.

The locking element is preferably a ring which is slideable upwardly and downwardly (relative to the normal upright orientation of an open-topped container) over the outer wall and depending securing lugs of the closure. Alternatively, with a ring shaped locking element, the movement thereof for securing the closure on the container may involve turning (twisting) it, that is, the locking ring may be screw threadedly or otherwise associated with the

closure outer wall such that by turning the locking ring it is caused to have a resultant downward movement over the securing lugs and a resultant upward movement when turned in the opposite direction.

Although a closure according to the invention will typically be circular in accordance with a circular cross-section container, it is within the scope of the invention that the closure may be other than circular to suit differently shaped containers, for example oval, square or rectangular.

A closure according to the invention may be manufactured from a harder, more rigid plastics material than prior plastic closures in that the need for the closure to flex or stretch is substantially eliminated. This reduces the likelihood of dry material, for example paint flakes, detaching from the closure and falling back into the container.

Preferably the closure as a whole is formed from a suitable plastics material, for example polypropylene, to provide the hardness and rigidity needed to avoid or at least substantially lessen the possibility of dry material detaching from the inside of the closure and falling into the container contents, which is a particular problem with containers of paint. The cover part of the closure may have a structural design, for example a grid pattern, that adds further rigidity.

According to a second aspect of the invention, for a closure that is wholly formed of a plastic material, the closure is formed as a one-piece moulding. Thus the cover with its peripheral structure and depending securing lugs (constituting a first part of the closure) and the locking element (constituting a second part of the closure) are formed as a one-piece moulding such that the locking element (second part) is separable from the cover (first part) during the initial assembly process of applying the closure to the container.

Alternatively the closure may be a composite structure comprising a metal lid having a plastic ring effectively permanently secured thereto, whereby the plastic ring and the metal lid constitute the cover portion of the closure, that

is, the portion having the peripheral structure for engaging the container rim that includes the outer wall from which the two securing lugs depend. An example of such a composite structure is disclosed in the applicant's International Patent Application No. WO 01/44069 A1 (PCT/AU00/01541). With such a composite structure, manufacture of the closure may also be completed in a single moulding operation, that is, the metal lid part may be provided and the remaining plastic parts of the closure moulded onto it.

Although a cover according to the invention will typically be wholly formed of a plastic material, or be a composite plastic/metal structure as in International Patent Application No. WO 01/44069 A1, it is considered that a wholly metal structure is possible as is a composite structure having a plastic cover portion and a metal surround that provides at least the outer wall of the peripheral structure, the depending securing lugs and the locking element.

The closure may be moulded from a plastic material with the securing lugs in their preferred "normal" position, that is, where they are angled away from the container side wall. This creates a memory in the material whereby the lugs will return to this position whenever the locking element is in its upper position whereat the securing lugs are released. This contributes to the ease of use of the closure. Thus removal of the closure is achieved by lifting or twisting the locking element which allows the securing lugs to spring outwardly and for the continual lifting or twisting of the locking element to remove the whole closure in one basic motion.

Preferably the securing lugs include a formation on their inner surfaces for engaging a complementary formation on the side wall of the container. For example, such a formation may be a bead which engages in a groove formed in the container side wall. Such formations preferably are shaped to provide a camming action to "pull down" the closure onto the container rim. This provides an increased closing force and where the closure is such that it sealingly engages the container rim, ensures that an effective seal is established.

Preferably there are several securing lugs arranged to extend all the way around the closure.

For a locking element that is a ring which is slideable upwardly and downwardly, the outer wall of the peripheral structure of the closure may include grooves in the direction of movement of the locking ring and the locking ring may include complementary ribs which ride within the grooves to guide the downwards and upwards movement of the locking ring for pressing and releasing the securing lugs. Preferably the locking ring includes axial ribs whereas the outer wall of the peripheral structure is not grooved such that only the surfaces of the ribs slide over the outer wall. With this structure, the ribs impart strength to the locking ring whilst friction is reduced between the ring and the outer wall thereby easing the slideability of the ring.

Preferably the closure includes means for holding the locking element in its locking position whereat it presses the securing lugs against the container side wall. Such means may involve dimples on the locking element inside surface which snap into complementary depressions formed in the outer surfaces of the securing lugs and which are relatively readily releasable by applying an increased moving force to the locking element. Alternatively such a holding means may include interengaging parts requiring a positive action for release prior to or as part of moving the locking element, for example a press button arrangement. Persons skilled in the art will appreciate that many suitable holding arrangements are possible.

The peripheral structure for engaging the container rim may comprise a channel which seats over the container rim, wherein the outer wall is a wall of the channel. Normally there will be sealing engagement between the closure and the container rim in which case the peripheral structure may include a gasket compound which is compressed onto the rim when the closure is secured to the container thereby ensuring the closure is sealingly retained on the container. It is to be understood that the invention whilst encompassing resealable closures, is intended to encompass reusable closures that do not establish a hermetic seal between the closure and the container.

For a better understanding of the invention and to show how the same may be performed, an embodiment thereof will now be described, by way of non-limiting example only, with reference to the accompanying drawings.

Brief Description of The Drawings

Fig. 1 shows a closure according to an embodiment of the invention with its locking element in its locked position.

Fig. 2 shows the closure of Fig 1 with its locking element in an unlocked position and illustrative of the closure formed as a one-piece moulding.

Fig. 3 shows the closure of Fig. 1 and movement of the locking element for securing the closure onto a container.

Fig. 4 is a schematic cross-sectional view of the closure as in Fig. 2 on a container, with only a portion of the closure and the container shown.

Fig. 5 is a schematic cross-sectional view of the closure as in Fig. 3 on a container, with only a portion of the closure and the container shown.

Fig. 6 is a schematic cross-sectional view of the closure as in Fig. 1 on a container, with only a portion of the closure and the container shown.

Detailed Description of Preferred Embodiment

The closure 20 shown in the figures is wholly formed of plastic and may also be made as a one piece moulding (as will be described in more detail below). The closure 20 is for a circular cross section container (not illustrated) and thus is itself circular. The closure 20 is for closing the top opening of a container 21 (see Figs. 4-6), the container having a side wall 23 and the top opening being defined by a rim 27. The closure 20 includes a central cover 22 that has a peripheral structure 24 that forms a channel 25. The peripheral channel 25 includes an outer wall 26 that surrounds the upper end of the side wall 23 of a container 21 when the rim 27 of the container opening is received within the peripheral channel 25. A plurality of securing lugs 28 depend from a bottom end 30 of the outer wall 26 and are affixed thereto by hinge portions 32 for the securing lugs 28 to be pivotally moveable towards and away from the container side wall 23. The securing lugs 28 extend around the closure 20 with small gaps 34 therebetween and the moulding is such that each hinge portion

32 normally holds its securing lug 28 in an outwardly angled position, that is, angled away from the side wall 23 of the container 21(see Figs. 2 and 4).

The closure 20 also includes a locking element 36 in the form of a ring which surrounds the outer wall 26 of the peripheral channel 25 of the cover 22 and is moveable over the outer wall 26 and over the depending securing lugs 28 to cause the securing lugs 28 to pivot inwardly towards the container side wall 23. The locking ring 36 is a sliding fit around the outer wall 26 and when manually pressed, it slides downwardly over that wall 26 until its lower edge 38 contacts the outwardly angled upper surfaces of the securing lugs 28 whereupon further downward movement of the locking ring 36 cams the securing lugs 28 inwardly for them to pivot about hinge portions 32 until they press against the container side wall. Figs. 3 and 5 illustrate the downward movement of locking ring 36 (see arrow A) to pivot the securing lugs 28 inwardly (see arrow B on Fig. 5).

The securing lugs 28 each include a formation, namely a transverse bead 40 on their inner surfaces for engaging a complementary formation, namely a circumferential groove 41 in the container side wall 23. Such a groove 41 may be shaped relative to the shape of the beads 40 that as the securing lugs 28 and thus the beads 40 are pressed inwardly by the locking ring 36 the interengagement of the beads 40 and container groove provides a camming action to more tightly "pull" the closure 20 down onto the container rim 27. The locking ring 36 is pushed downwardly until the beaded securing lugs 28 are tightly pressed against the container side wall 23 (in groove 41) thereby securing the closure 20 on the container 21.

When it is desired to remove the closure 20 from a container, all that is required is for an operator to manually slide the locking ring 36 upwardly for it to release the securing lugs 28 allowing them to spring outwardly due to the "memory" of the hinge portions 32 to return to their normal position.

As best seen in Fig. 2, the locking ring 36 includes a circumferential flange 42 on its inside surface adjacent its lower edge 38 and axial ribs 44 extending from the flange 42 and spaced around the inner surface of the locking

ring 36. The flange 42 and ribs 44 impart a degree of rigidity to the locking ring 36 for it to function as required. Also, as it is the inner facing surfaces of the ribs 44 which slide over the relatively smooth surface of outer wall 26 the frictional engagement between these surfaces is less than would be the case if the locking ring 36 was not ribbed or if the ribs meshed with complementary shaped grooves in the outer wall 26 (because the area of contact is less). This reduces the manual force that needs to be applied to the locking ring 36 to slide it down over the securing lugs 28 or to pull it up to release the securing lugs 28.

As illustrated in Figs. 2 and 4, the closure 20 is preferably formed as a one-piece moulding wherein the locking ring 36 at its lower edge 38 is joined to the upper radially outermost edge of the peripheral structure 24 of the cover 22 (that is, at the edge where outer wall 26 depends from cover 22) by a frangible join 48. The frangible join 48 is a continuous thin section that is readily breakable during the initial assembly process of applying the closure 20 to a container in an automated packaging line.

The securing lugs 28 also include a circumferential groove 50 in their outer surfaces near their lower ends for receiving a complementary bead 52 on the inner surface of flange 42 of locking element 36. The beads 52 seat into grooves 50 when the locking element 36 is in its lowermost position to "lock" it into place. This locking action is released when it is desired to remove the closure 20 from a container 21 by applying a slightly increased lifting force to the locking element 36.

The invention disclosed herein is susceptible to variations, modifications and/or additions other than those specifically described or illustrated and it is to be understood that the invention includes all such variations, modifications and/or additions which fall within the scope of the following claims.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A re-usable closure for an open topped container wherein the container has a side wall and a top opening that is defined by a rim,

the closure including a cover having a peripheral structure for engaging the container rim, the peripheral structure including an outer wall for surrounding the side wall of the container,

the cover further including at least two spaced securing lugs that depend from the outer wall and are pivotally moveable towards and away from the container side wall,

the closure also including a locking element surrounding the outer wall and moveable thereover and over the depending securing lugs to press the securing lugs inwardly against the container side wall thereby securing the closure on the container,

wherein the locking element is oppositely moveable to release the securing lugs.

2. A re-usable closure as claimed in claim 1 wherein the locking element is formed as a ring, and wherein each securing lug has a normal position whereat it is angled away from the side wall of a container.

3. A re-usable closure as claimed in claim 1 or claim 2 wherein the locking element is slideably moveable downwardly to press the securing lugs inwardly and slideably moveable upwardly to release the securing lugs.

4. A re-usable closure as claimed in any one of claims 1 to 3 wherein each securing lug includes a formation on its inner surface for engaging a complementary formation in the side wall of a container.

5. A re-usable closure as claimed in any one of claims 1 to 4 formed as a one-piece moulding wherein a lower edge of the locking element is attached to an upper outer edge of the peripheral structure by a frangible join for the locking

element to be separable from the cover during initial packaging assembly of the closure onto a container.

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David B Fitzpatrick

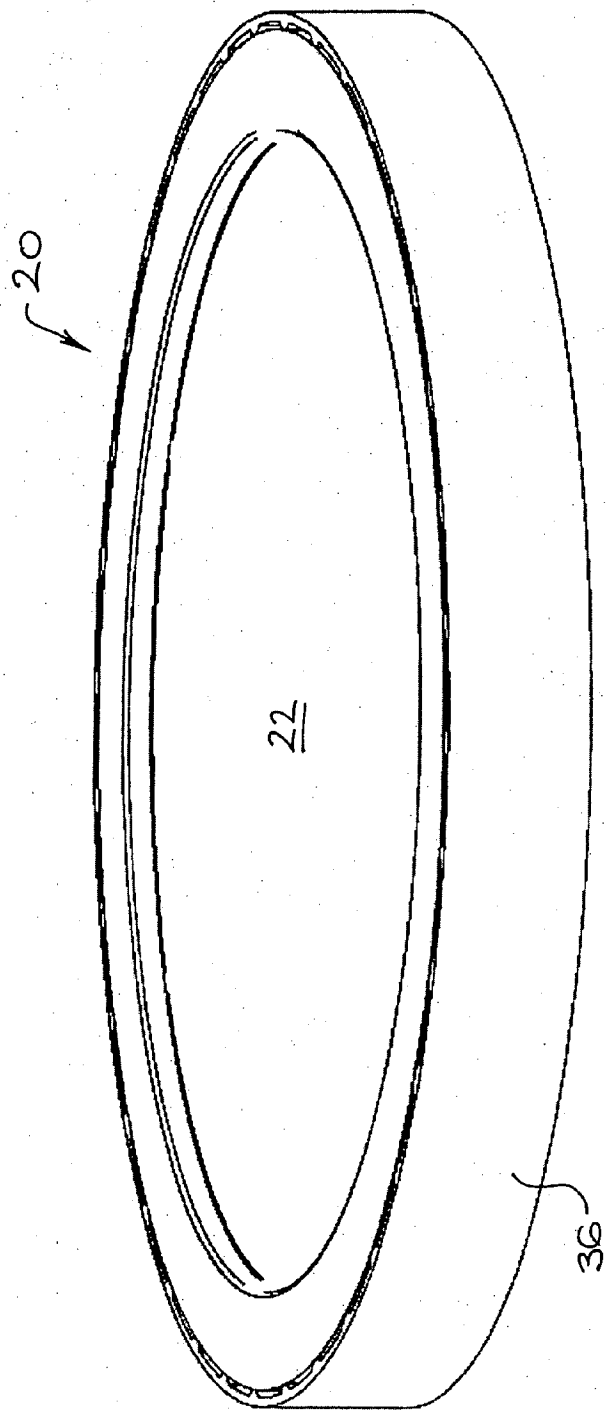

FIG 1

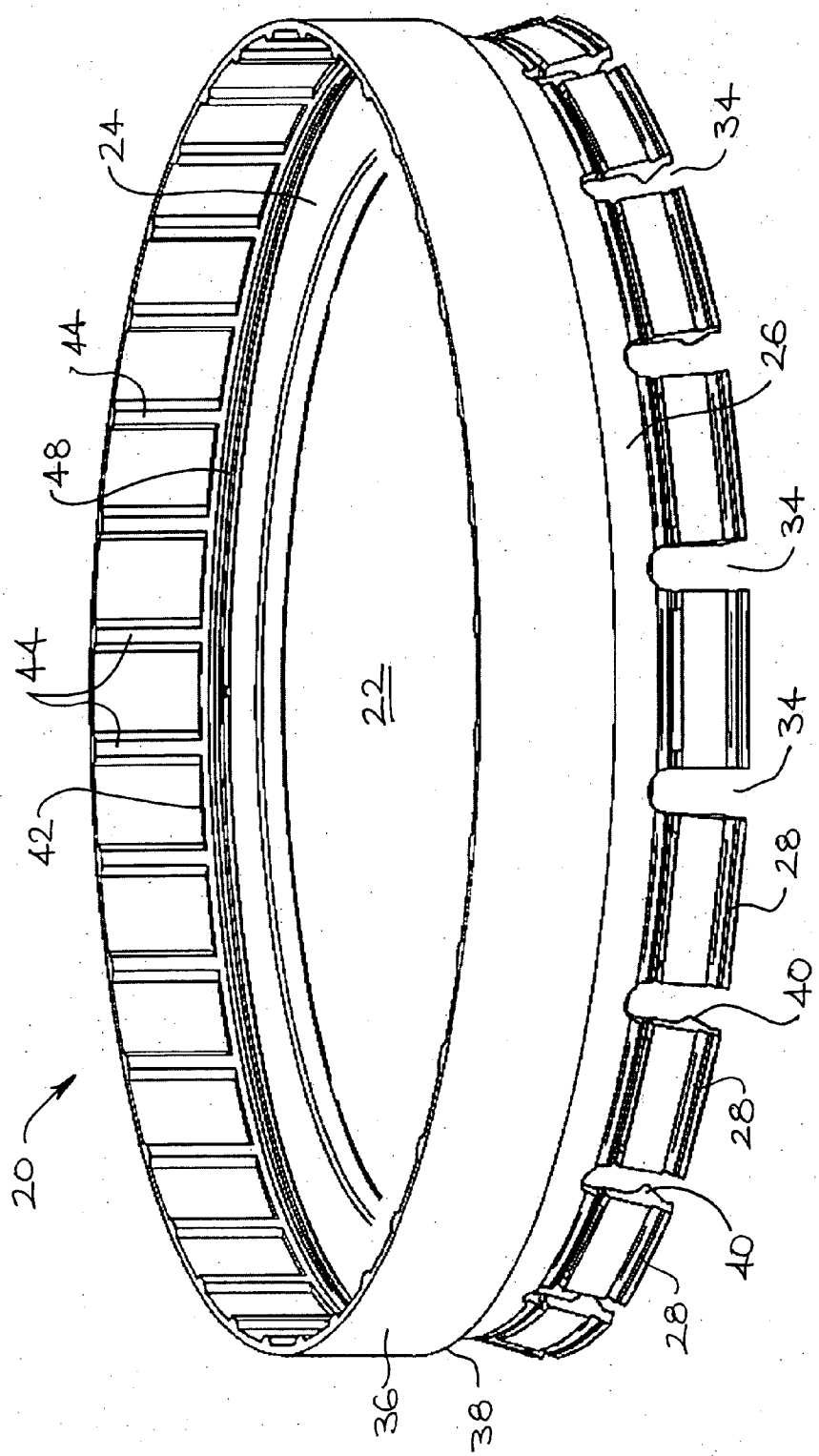

FIG 2

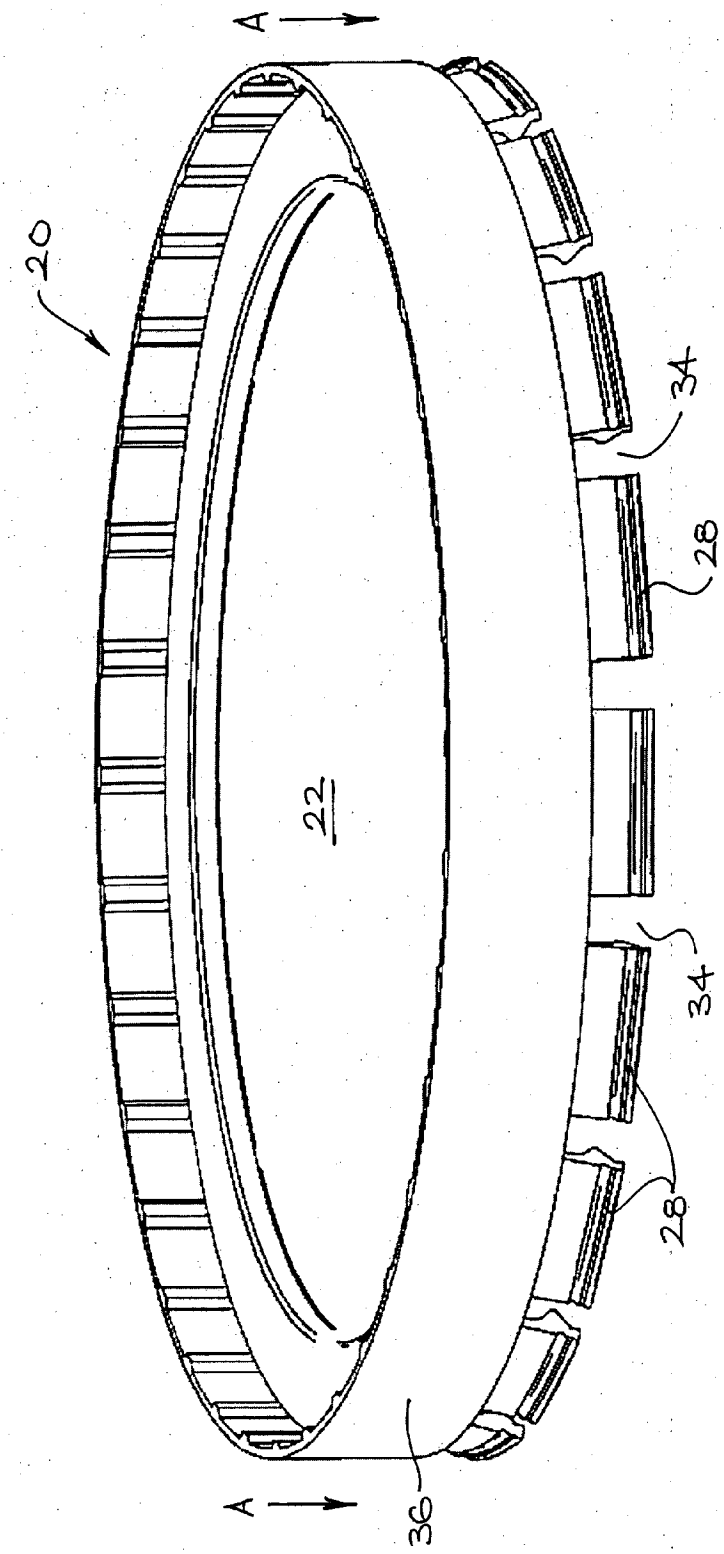

FIG 3

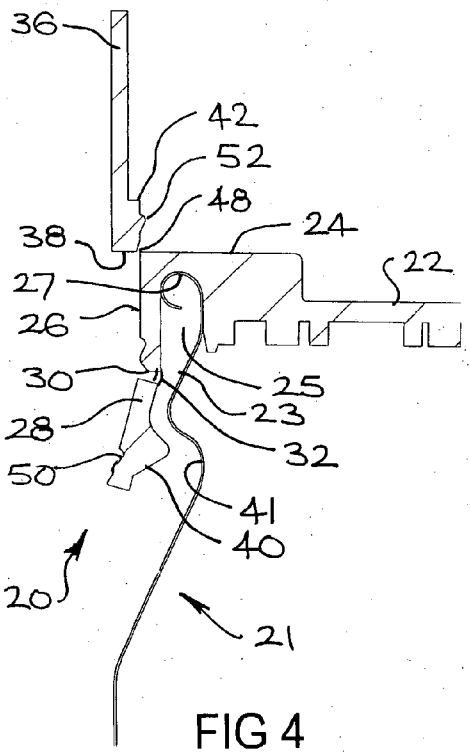

FIG 4

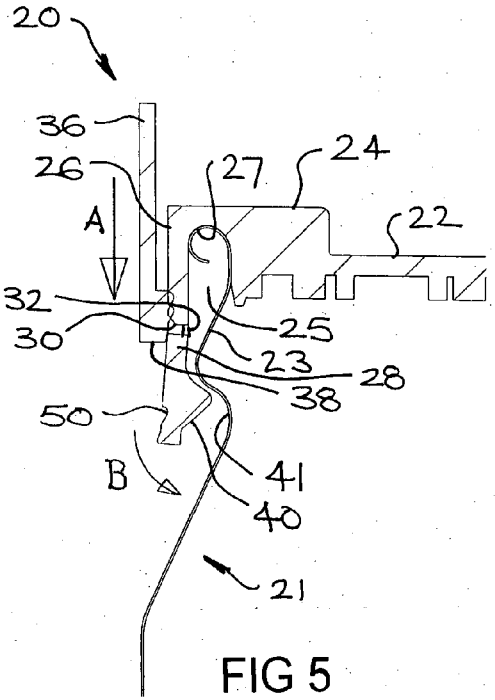

FIG 5

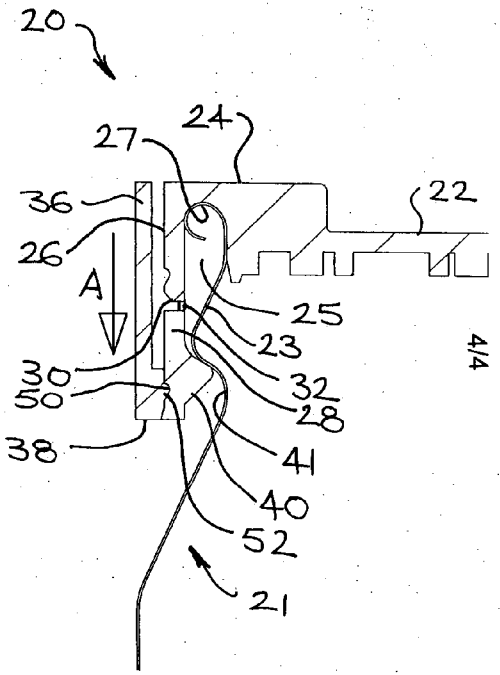

FIG 6