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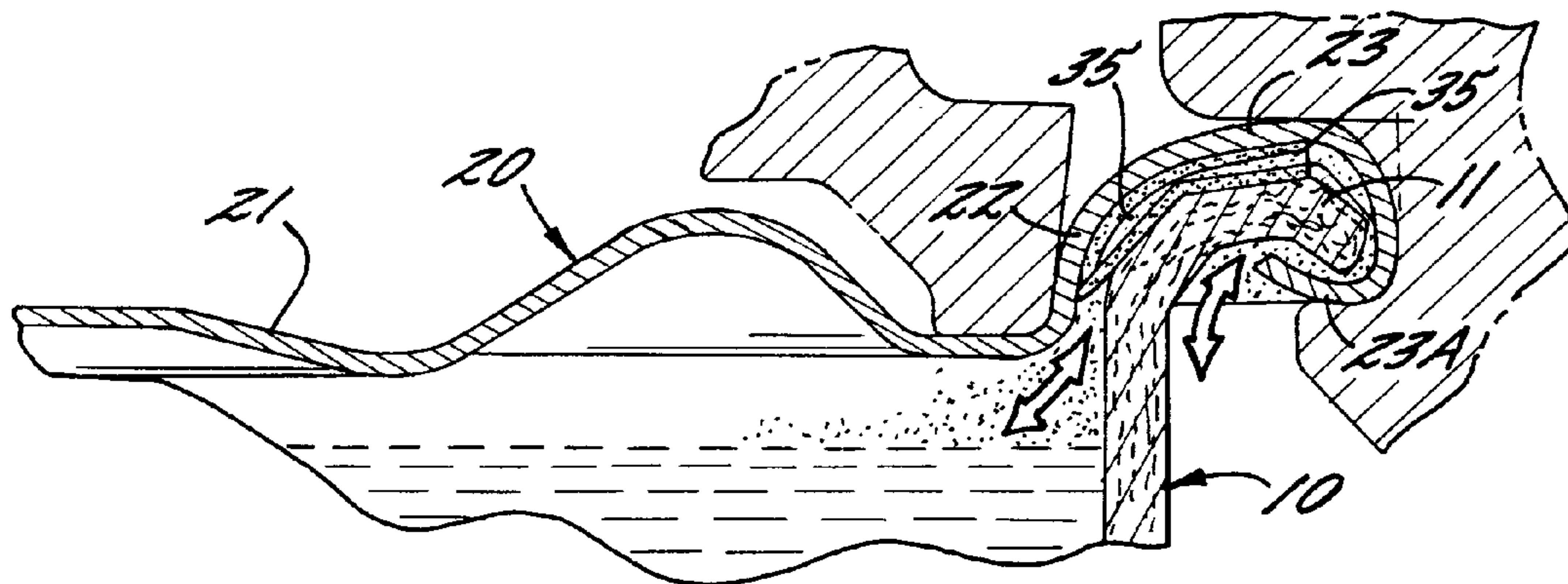
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(54) **BOITE ET COUVERCLE PERMETTANT L'INJECTION ET
L'EVACUATION DE GAZ EN COURS DE SERTISSAGE**

(54) **A CONTAINER AND END CLOSURE ADAPTED FOR
EVACUATING AND BACK-FLUSHING OF GASES DURING
CLOSING**



(57) Cette invention concerne une boîte et un couvercle à assembler par sertissage en deux passes qui permet l'évacuation d'air ainsi que l'injection de gaz dans la boîte et son évacuation avant la passe de serrage étanche du serti. Le couvercle comprend une partie circulaire centrale, une paroi de cuvette autour de la périphérie extérieure de la partie circulaire centrale se projetant obliquement vers le haut et l'extérieur et un bord à sertir autour de la paroi de cuvette se prolongeant radialement vers l'extérieur et présentant à sa périphérie un ourlet à

(57) A container and end adapted for closing and sealing the container with a double-seaming operation is provided which permits evacuating and back-flushing of gases out of and into the container while the end is in a seated and unseamed position on the container during the closing operation. The end includes a central circular panel, a chuck wall surrounding an outer periphery of the central panel and extending radially outwardly and upwardly from the central panel and a crown seaming panel surrounding the chuck wall and extending radially



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sertir en deux passes autour du bord à sertir de la boîte pour réaliser la fermeture étanche de la boîte. Le couvercle comprend de préférence un joint déposé sur la surface intérieure de la paroi de cuvette et de la couronne du bord à sertir. Des saillies se prolongeant radialement vers le centre du couvercle sont formées de place en place sur la paroi de cuvette et la couronne du bord à sertir afin de former entre elles, lorsqu'elles sont appuyées contre le bord à sertir de la boîte, des canaux pour l'injection et l'évacuation de gaz avant la seconde passe de l'opération de sertissage, soit l'écrasement.

outwardly from the chuck wall and having an outer curled end for being double-seamed with a flanged upper end portion of the container for closing of the container. The end preferably includes sealing compound positioned on an inside surface of the chuck wall and the crown seaming panel. Separate projections are formed in the chuck wall and in the crown seaming panel of the end and extend inwardly and radially of the chuck wall and crown seaming panel, respectively, and are spaced around the chuck wall and the crown seaming panel for engaging the flanged upper end of the container being closed for forming gas channels between the respective projections and between the flanged upper end of the container and the chuck wall and the crown seaming panel of the end when such end is in a seated and unseamed position on the container during closing and prior to completion of the double-seaming operation.

Abstract

A container and end adapted for closing and sealing the container with a double-seaming operation is provided which permits evacuating and back-flushing of gases out of and into the container while the end is in a seated and unseamed position on the container during the closing operation. The end includes a central circular panel, a chuck wall surrounding an outer periphery of the central panel and extending radially outwardly and upwardly from the central panel and a crown seaming panel surrounding the chuck wall and extending radially outwardly from the chuck wall and having an outer curled end for being double-seamed with a flanged upper end portion of the container for closing of the container. The end preferably includes sealing compound positioned on an inside surface of the chuck wall and the crown seaming panel. Separate projections are formed in the chuck wall and in the crown seaming panel of the end and extend inwardly and radially of the chuck wall and crown seaming panel, respectively, and are spaced around the chuck wall and the crown seaming panel for engaging the flanged upper end of the container being closed for forming gas channels between the respective projections and between the flanged upper end of the container and the chuck wall and the crown seaming panel of the end when such end is in a seated and unseamed position on the container during closing and prior to completion of the double-seaming operation.

**A CONTAINER AND END CLOSURE
ADAPTED FOR EVACUATING AND
BACK-FLUSHING OF GASES DURING CLOSING**

Field Of The Invention

This invention relates to a container and end for closing and sealing the container with a double seaming operation and being adapted for permitting evacuating and back-flushing of gases out of and into the container while the end is in a seated and unseamed position on the container during the closing operation.

Background Of The Invention

Heretofore, it has been conventional practice in the packaging field to manufacture metallic containers or cans for storage of comestibles, beverages and other various products which include a cylindrical open-end container body fabricated from sheet metal and having a metal end closure which is double-seamed onto an outwardly flanged end portion of the container body at one or both ends and which includes a sealing compound between the metal end closure and the flanged end portion of the container body. Such closing operation of the end on the container utilizing double-seaming has been a favored form of assembling containers and end closures since it is readily adapted to production line manufacturing capabilities and at the same time providing a reliable hermetic seal capable of withstanding substantial pressure differentials which may exist, or be encountered, between the ambient atmosphere and the interior confines of the filled container during processing of the container's contents or during subsequent shipping and storing.

During the closing operation of the end on the container, it is often desired to evacuate gases from the container with the contents therein and back-fill the container with other gases, i.e. evacuating oxygen and back-filling with nitrogen. In order to be able to carry out this evacuating and back-filling of gases, it is necessary when the end is positioned on the

container that there be provided gas channels between the end and the flanged end portion of the container and that premature sealing between the end and the container by the sealing compound be avoided at the gas channels. Heretofore, this has been primarily accomplished by utilizing "stand-off
5 beads" produced by forming a rounded dimple in the upper surface of the crown seaming panel, i.e. that portion of the end which is deformed during the double-seaming closing operation. This in turn forms an inwardly extending projection for engaging and maintaining the end in a slightly raised relationship on the flanged outer end portion of the container when the end is
10 positioned on the container for closing and prior to completion of the double-seaming operation so that the evacuation and back-flushing of gases out of and into the container can be performed with devices on the conventional container closing apparatus and just prior to hermetic sealing of the container.

Due in large part to manufacturing and shipping costs
15 considerations and costs of materials, the container industry has been moving away from the use of metal containers and towards the use of plastic or preferably composite containers, i.e. container bodies fabricated from coated or uncoated fibrous material or composite multiple layers of fibrous material together with other compatible layers of materials such as plastic and/or foil
20 liners, etc. The use of composite materials for the container have created additional problems or enhanced current problems with the evacuating and back-flushing of gases out of and into the container during the closing operation. For example, premature sealing of the flanged upper end of the composite container with the metal end through the sealing compound occurs
25 due to the lack of stiffness in the composite container, as compared to a metal container, at the area in which the "stand-off beads" on the crown seaming panel of the metal end engage the flanged upper end portion of the composite container. Also, it has been found that the composite containers suffered from a condition described as "necking-in" which occurs when the inside
30 diameter of the composite container is reduced due to the evacuating and back-flushing of gases and the closing of the metal end on the composite container with the double-seaming operation. This process can push the

metal end into the flanged area of the container body plugging up the opening into the container. Metal container bodywalls are stronger and usually prevent this necking-in condition.

Object And Summary Of The Invention

5 Accordingly, it is an object of this invention to provide a generally cylindrical container and a generally circular end adapted for closing and sealing the container with sealing compound and a double-seaming operation and which is adapted for overcoming prior problems and permit superior evacuating and back-flushing of gases out of and into the container
10 while the end is in a seated and unseamed position on the container during the closing operation.

By this invention, it has been found that the above object may be accomplished by providing an end which includes a central circular panel, a chuck wall surrounding an outer periphery of the central panel and
15 extending radially outwardly and upwardly from the central panel and a crown seaming panel surrounding the chuck wall and extending radially outwardly from the chuck wall and having an outer curled end. The chuck wall and the crown seaming panel preferably have sealing compound on a portion of their inner surfaces and are the portions which are double-seamed
20 with the flanged outer end portion of the container.

Separate projections are formed in the chuck wall and in the crown seaming panel and extend inwardly and radially of the chuck wall and the crown seaming panel, respectively. These projections are spaced around the chuck wall and around the crown seaming panel and are adapted to
25 engage the flanged upper end of the container being closed for forming gas channels between the respective projections and between the flanged upper end of the container and the chuck wall and the crown seaming panel of the end when the end is in a seated and unseamed position on the container during the double-seaming closing operation.

30 Preferably, the projections alternate in spacing between the chuck wall and the crown seaming panel around the end. It is also preferable that the gas channel-forming projections in one of the chuck walls or crown

-4-

seaming panel comprise pairs of closely spaced projections in which the pairs of projections are equally spaced around the end. It is also preferable that the gas channel-forming projections in one, preferably the other, of the chuck wall and the crown seaming panel comprise single projections equally spaced around the end. It has also been found particularly preferable to position the pairs of projections in the chuck wall and to position the single projections in the crown seaming panel.

While this invention is particularly adapted for use with a metal end double-seamed on and closing a composite container, it is also applicable for use with an end constructed of either metal or plastic and a container constructed of metal, plastic or composites.

In accordance with an aspect of the invention, a generally circular end adapted for use in closing and sealing an outwardly-flanged open upper end of a cylindrical container with a double seaming operation and adapted for permitting evacuating and back-flushing of gases out of and into the container while said end is in a seated and unseamed position on the container during the closing operation; said end comprising:

a central circular panel;
a chuck wall surrounding an outer periphery of said central panel and extending radially outwardly and upwardly from said chuck wall and having an outer curled end;

and separate projections formed in said chuck wall and in said crown seaming panel and extending inwardly and radially of said chuck wall and said crown seaming panel, respectively, and being spaced around said chuck wall and said crown seaming panel and adapted to engage

-4a-

the flanged upper end of the container being closed for forming gas channels between said respective projections and between the flanged upper end of the container and
5 said chuck wall and said crown seaming panel of said end when said end is in a seated and unseamed position on the container during the closing.

Brief Description of the Drawings

Some of the objects and advantages of this invention
10 have been set forth above, other objects and advantages will appear in the Detailed Description Of The Preferred Embodiment Of The Invention to follow, when taken in conjunction with the accompanying drawings in which:

Fig. 1 is an exploded side elevational view, cut
15 away, of a container and end closure (shown in section) constructed in accordance with this invention;

Fig. 1A is an enlarged sectional view of a portion of the end closure as shown in Fig.1 and taken within the circle indicated in Fig. 1;

20 Fig. 2 is a top plan view, taken generally along the line 2-2 of Fig. 1, of the end closure;

Fig. 3 is an enlarged partial top plan view of an area, as shown in the circle in Fig. 2, of the chuck wall of the end closure having a pair of projections therein
25 for forming gas channels;

Fig. 4 is an enlarged sectional view, taken generally along the line 4-4 of Fig.3;

Fig. 5 is a sectional view, taken generally along the line 5-5 of Fig. 4;

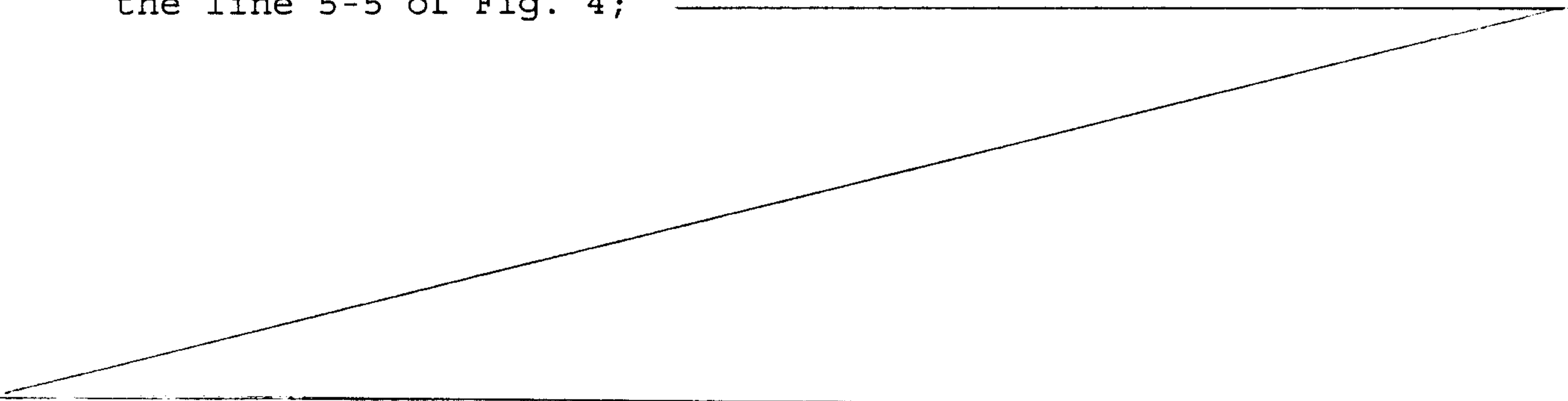


Fig. 6 is an enlarged partial top plan view of an area, as shown in the circle in Fig. 2, of the crown seaming panel of the end closure having a single projection therein for forming gas channels;

Fig. 7 is an enlarged sectional view, taken generally along the
5 line 7-7 of Fig. 6;

Fig. 8 is a section view, taken generally along the line 8-8 of Fig. 7; and

Figs. 9A-E are sequential sectional views, like Figs. 4 and 7, illustrating the sequential steps involved in closing of the flanged end of a
10 container with an end using a double-seaming operation and while evacuating and back-flushing of gases from and into the container during such closing operation.

Detailed Description Of The Preferred Embodiment Of The Invention

15 Referring now to the drawings, a generally cylindrical container 10 and a generally circular end 20 constructed in accordance with this invention are illustrated in exploded condition in Fig. 1 with the container 10 being broken away to conserve space. The generally cylindrical container 10 includes an outwardly-flanged upper end portion 11 for being double-seamed
20 with the end 20 to close the container 10 in a manner to be described more fully below. The bottom 12 of the container 10 may be closed in any conventional manner or may include an end 20 of the type to be described more specifically below. The container 10 may be constructed of metal or plastic, but preferably is constructed of composites. Composites are well
25 known in the container industry and may include multiple layers of various materials which may be spirally wound, convolutely wound or otherwise formed into a cylindrical container. These composite materials and their manufacture into a cylindrical container are well known by those with ordinary skill in the art and further explanation herein is not deemed
30 necessary.

The end 20 used for closing of the container 10 by a double-seaming operation includes a central circular panel 21 and a chuck wall 22

surrounding an outer periphery of the central panel 21 and extending radially outwardly and upwardly from the central panel 21. The end 20 further includes a crown seaming panel 23 surrounding the chuck wall 22 and extending radially outwardly from the chuck wall and having an outer curled end 23A. Sealing compound 33, 34 (to be discussed in more detail below) is preferably positioned on an inside surface of a portion of the chuck wall 22 and a portion of the crown seaming panel 23. Preferably, the compound 33, 34 does not extend past the center line CL of the crown seaming panel and does not extend down the chuck wall past the curl height CH of the outer curled end 23A, as shown in Fig. 1A. This sealing compound 33, 34 may comprise any suitable sealing compounds including synthetic rubbers, etc. The chuck wall 22 and crown seaming panel 23 with curled outer end 23A are utilized to be double-seamed with the flanged outer end portion 11 of the container 10 during the double-seaming operation, as shown schematically in Figs. 9A-9E wherein these components are deformed and bent in sequence to form the ultimate double-seam by conventional container closing apparatus (also schematically shown) in a manner well understood by those with ordinary skill in the art.

Separate projections 31, 32 are formed in the chuck wall 22 and in the crown seaming panel 23 and extend inwardly and radially of the chuck wall 22 and crown seaming panel 23, respectively, and are spaced around the chuck wall 22 and crown seaming panel 23, as shown particularly in Fig. 2. Chuck wall projections 31 include compound 33 and crown seaming panel projections 32 include compound 34 on their respective inside surfaces. These projections 31, 32 engage the flanged upper end 11 of the container 10 being closed for forming gas channels 35 between respective projections 31, 32 and the sealing compound 33, 34 and between the flanged upper end portion 11 of the container 10 and the chuck wall 22 and the crown seaming panel 23 of the end 20 when the end 20 is in a seated and unseamed position on the container 10 during closing, as shown in Figs. 3-8 and in Figs. 9A-9E.

The size and shape, along with the number, of projections 31, 32 and resulting gas channels 35 utilized on each end 20 and the placement

thereof in the chuck wall 22 and crown seaming panel 23 may vary due to the diameter of the end 20, the thickness of the material forming the end 20, countersink depth or other constructional features. However, it has been found preferred to alternate the projections 31, 32 in their spacing between the chuck 22 and crown seaming panel 23 around the end 20, as shown particularly in Fig. 2. It has also been found preferable that the channel forming projections 31, 32 in one of the chuck wall 22 or crown seaming panel 23 comprise pairs of closely spaced projections and in which said pairs of projections are equally spaced around the end. It has also been found preferable that the channel forming projections 31, 32 in one of the chuck wall 22 or crown seaming panel 23 comprise single projections equally spaced around the end 20. It has been found further desirable that the projections 31 in the chuck wall 22 comprise the pairs of closely spaced projections which are equally spaced around the end 21 and wherein the gas channel-forming projections 32 in the crown seaming panel 23 comprise the single projections equally spaced around the end 20 and wherein the pairs of projections 31 in the chuck wall 22 alternate in spacing with the single projections 32 in the crown seaming panel 23, as shown in Fig. 2. For a 4-1/32 inch diameter end 20 (commonly referred to in the industry as a "401 diameter end") illustrated in the drawings, it has been found preferable to utilize eight pairs of closely spaced projections 31 equally spaced around the end 20 and alternating with eight single projections 32 on the crown seaming panel 23 and equally spaced around the end 21.

With this arrangement of alternating projections 31, 32 between the chuck wall 22 and the crown seaming panel 23, sufficient gas forming channels 35 are provided between such projections and between the chuck wall 22 and crown seaming panel 23 and flanged outer end portion 11 of container 10 and the sealing compound 33, 34 therebetween, when the end 20 is in a seated and unseamed position on the container 10 during closing, as shown in Figs. 3-8 and as shown in Figs. 9A-9C. Gases may be evacuated out of the container 10 and then gases may be back-flushed into the container 10 during the double-seaming closing operation, as shown schematically in Figs.

9A-9E. This preferred arrangement of projections 31, 32 forming gas channels 35 has been found to satisfactorily allow this gas evacuating and back-flushing operation during the double-seaming closing operation when utilizing a container 10 constructed of composites and an end 20 constructed of metal; 5 however, it will also perform satisfactorily with a container 10 constructed of metal, plastic or composites and an end 20 constructed of metal or plastic.

In the drawings and specification, there have been set forth preferred embodiments of this invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for 10 purposes of limitation. The scope of the invention is defined in the following claims.

CLAIMS:

1. A generally circular end adapted for use in closing and sealing an outwardly-flanged open upper end of a cylindrical container with a double seaming operation and adapted for permitting evacuating and back-
5 flushing of gases out of and into the container while said end is in a seated and unseamed position on the container during the closing operation; said end comprising:
 - a central circular panel;
 - a chuck wall surrounding an outer periphery of said central
10 panel and extending radially outwardly and upwardly from said central panel;
 - a crown seaming panel surrounding said chuck wall and extending radially outwardly from said chuck wall and having an outer curled end;
 - and separate projections formed in said chuck wall and in said
15 crown seaming panel and extending inwardly and radially of said chuck wall and said crown seaming panel, respectively, and being spaced around said chuck wall and said crown seaming panel and adapted to engage the flanged upper end of the container being closed for forming gas channels between said
20 respective projections and between the flanged upper end of the container and said chuck wall and said crown seaming panel of said end when said end is in a seated and unseamed position on the container during the closing.
2. An end, as set forth in claim 1, wherein said gas channel-forming projections alternate in spacing between said chuck wall and said crown seaming panel around said end.
- 25 3. An end, as set forth in claim 1 or 2, wherein said gas channel-forming projections in one of said chuck wall and said crown seaming panel comprise pairs of closely spaced projections and in which said pairs of projections are equally spaced around said end.

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4. An end, as set forth in any one of claims 1 to 3, wherein said gas channel-forming projections in one of said chuck wall and said crown seaming panel comprise
5 single projections equally spaced around said end.

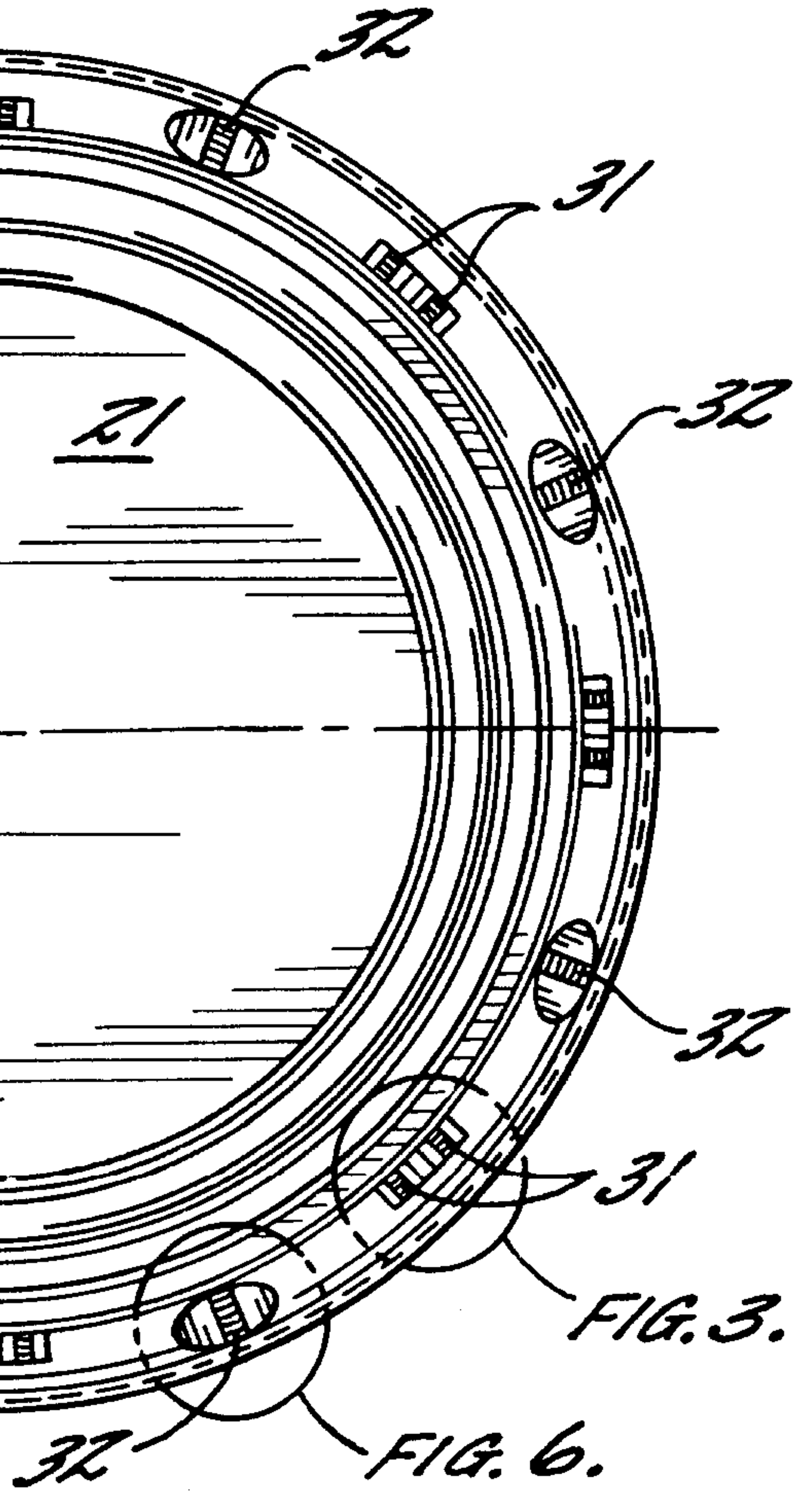
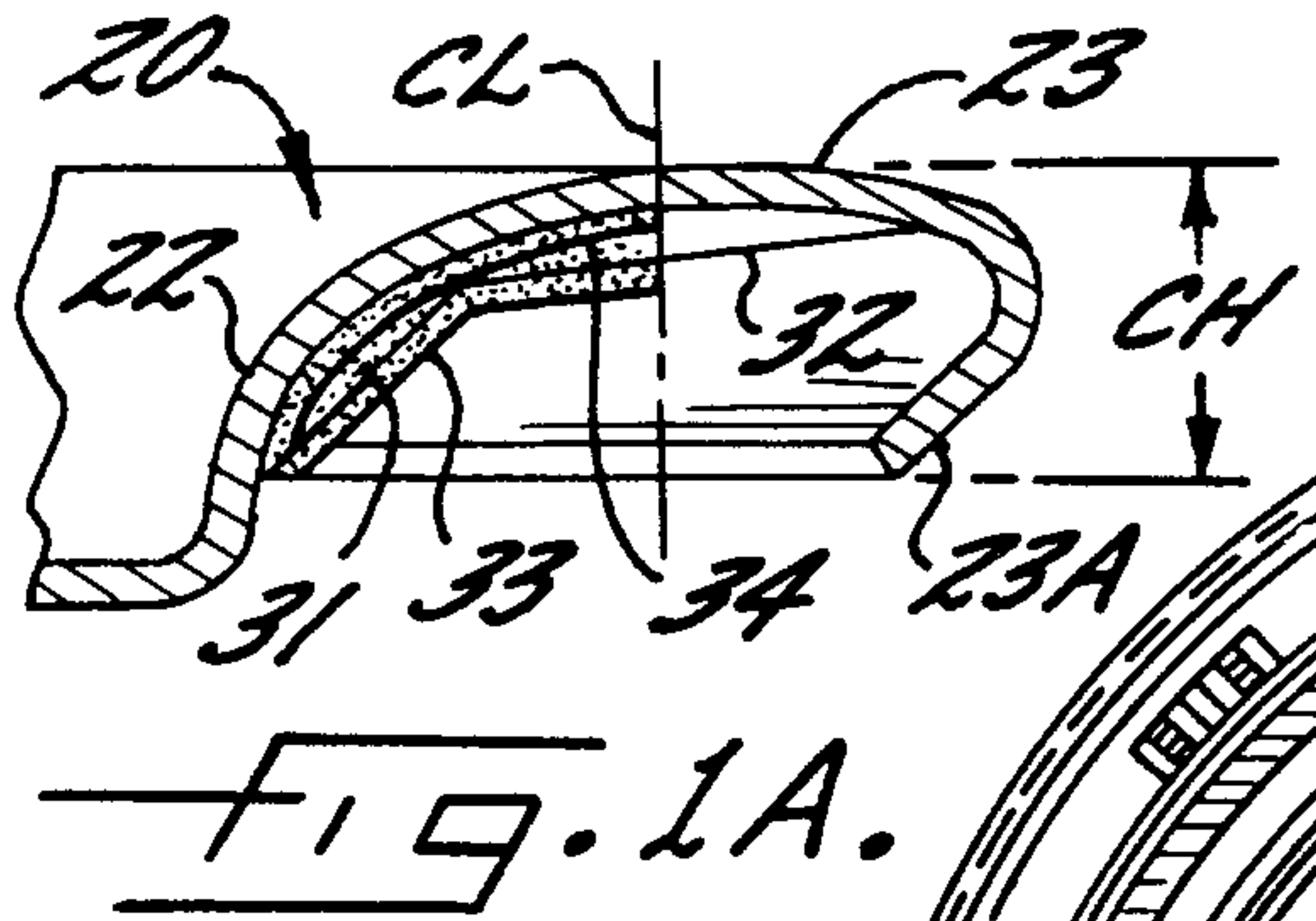
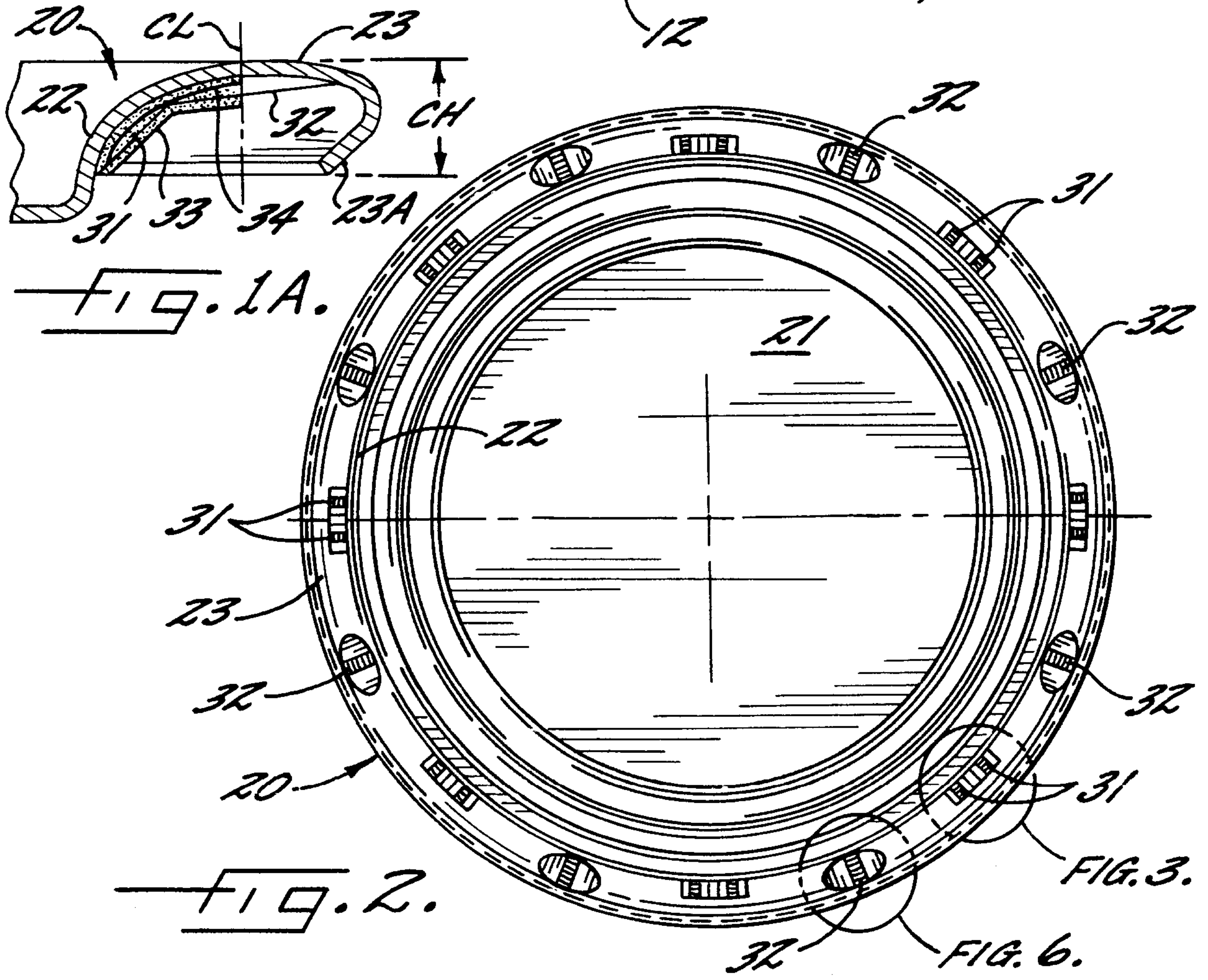
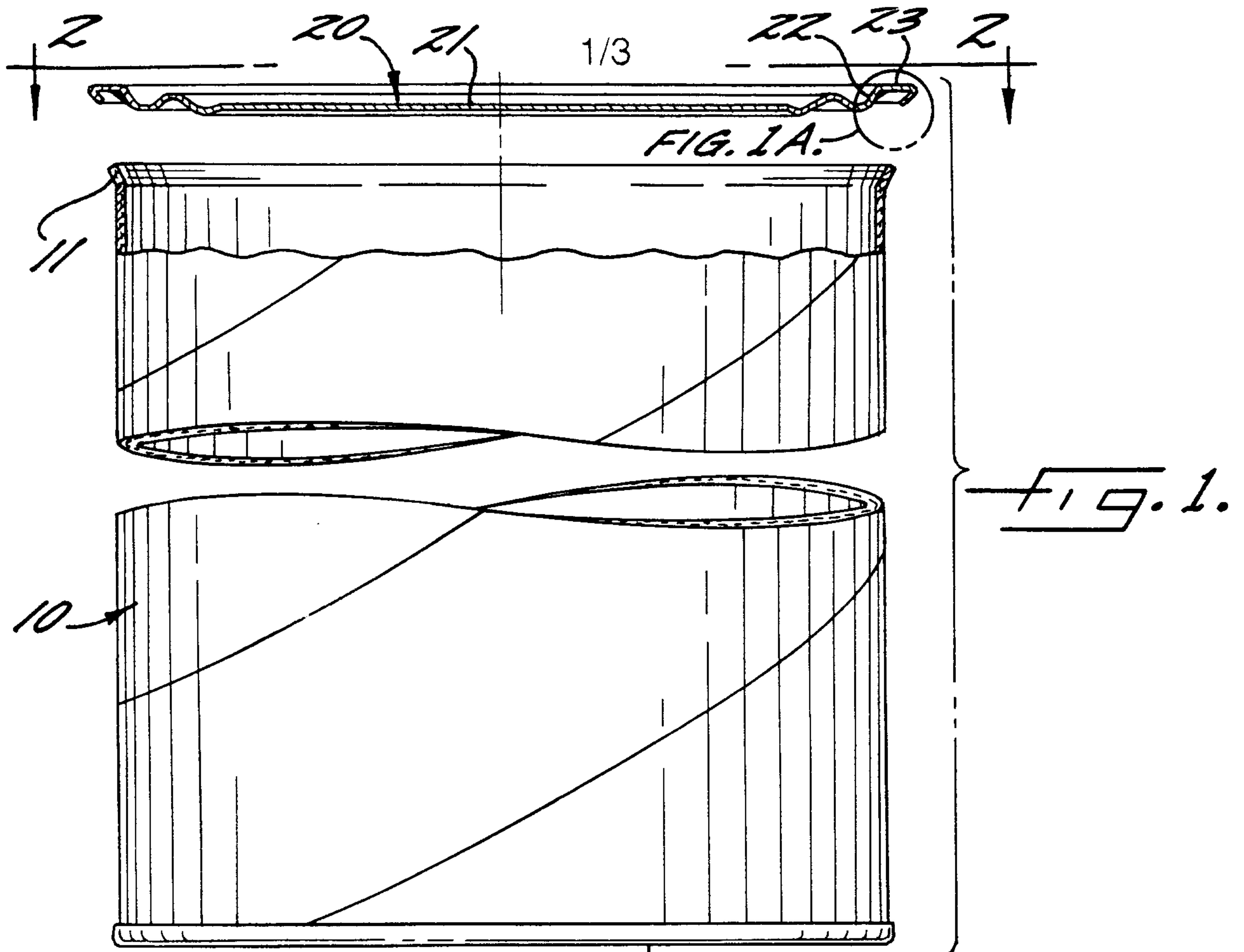
5. An end, as set forth in claim 1 or 2, wherein said gas channel-forming projections in one of said chuck wall and said crown seaming panel comprise pairs of
10 closely spaced projections and in which said pairs of projections are equally spaced around said end, and wherein said gas channel-forming projections in the other of said chuck wall and said crown seaming panel comprise
15 single projections equally spaced around said end.

6. An end, as set forth in claim 5, wherein said pairs of closely spaced projections comprise 8 pairs of projections equally spaced around said end, and wherein said single projections comprise 8 single projections
20 equally spaced around said end.

7. An end, as set forth in claim 5, wherein said end is constructed of a material selected from the group consisting of metal or plastic.
25

8. An end, as set forth in any one of claims 1 to 7, wherein said end further includes sealing compound positioned on an inside surface of said chuck wall and said crown seaming panel.
30

9. An end, as set forth in claim 8, in which said sealing compound does not extend past a center line of said crown seaming panel and does not extend down said chuck wall more than a height of said outer curled end.



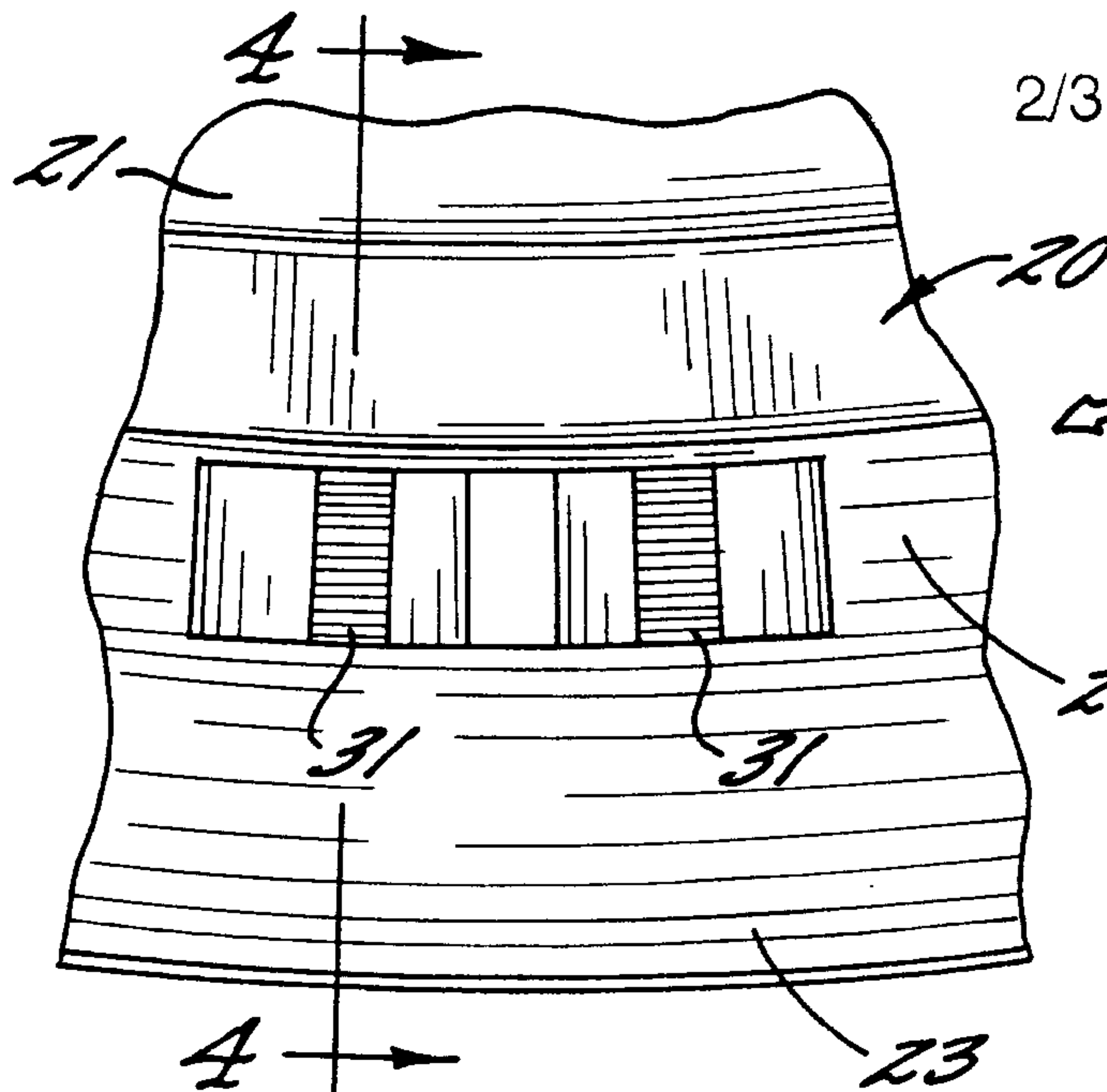


FIG. 3.

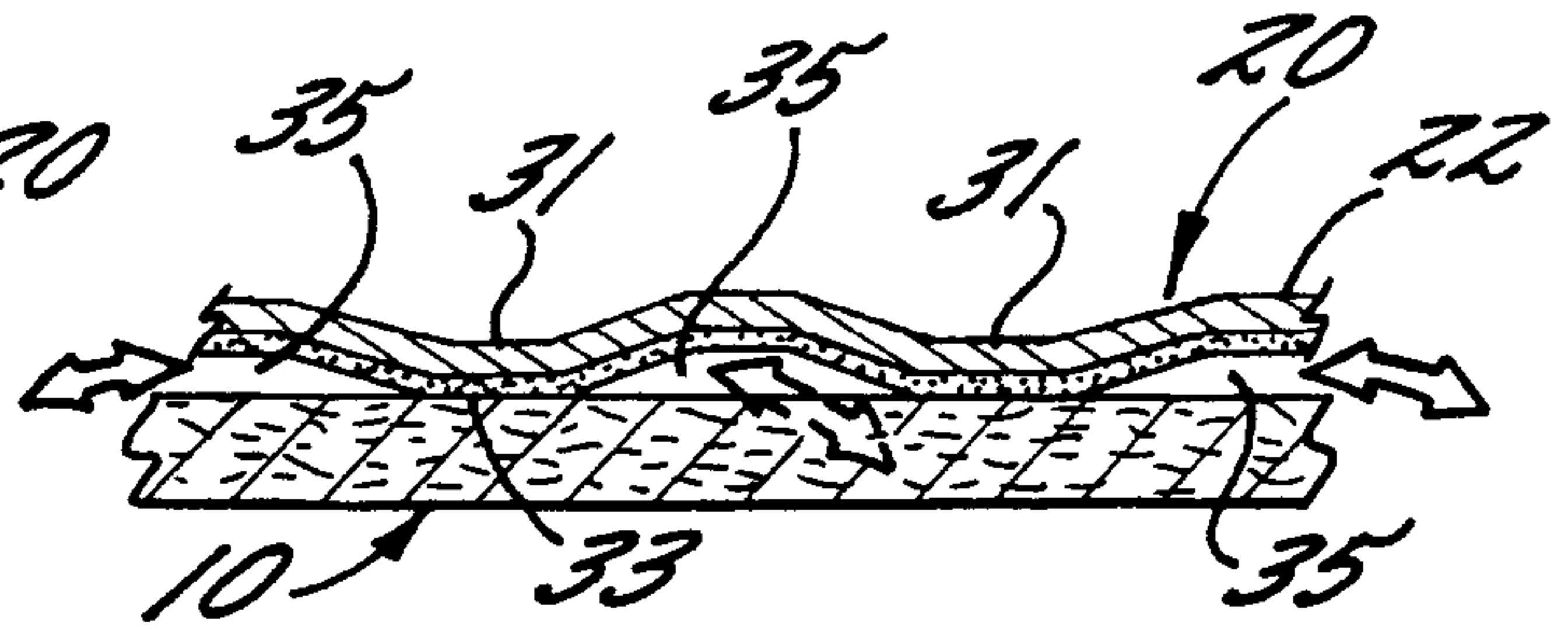


FIG. 5.

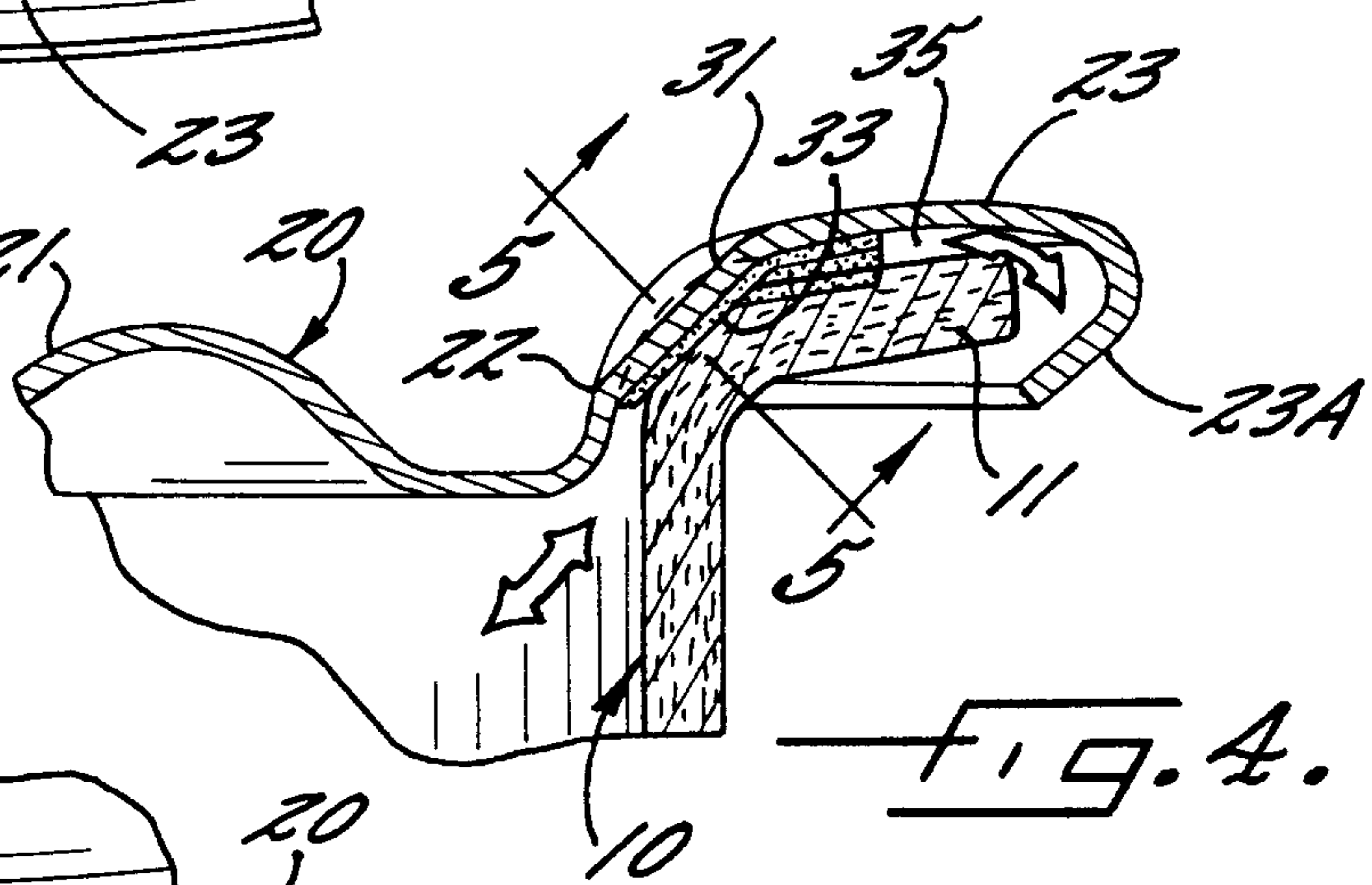


FIG. 4.

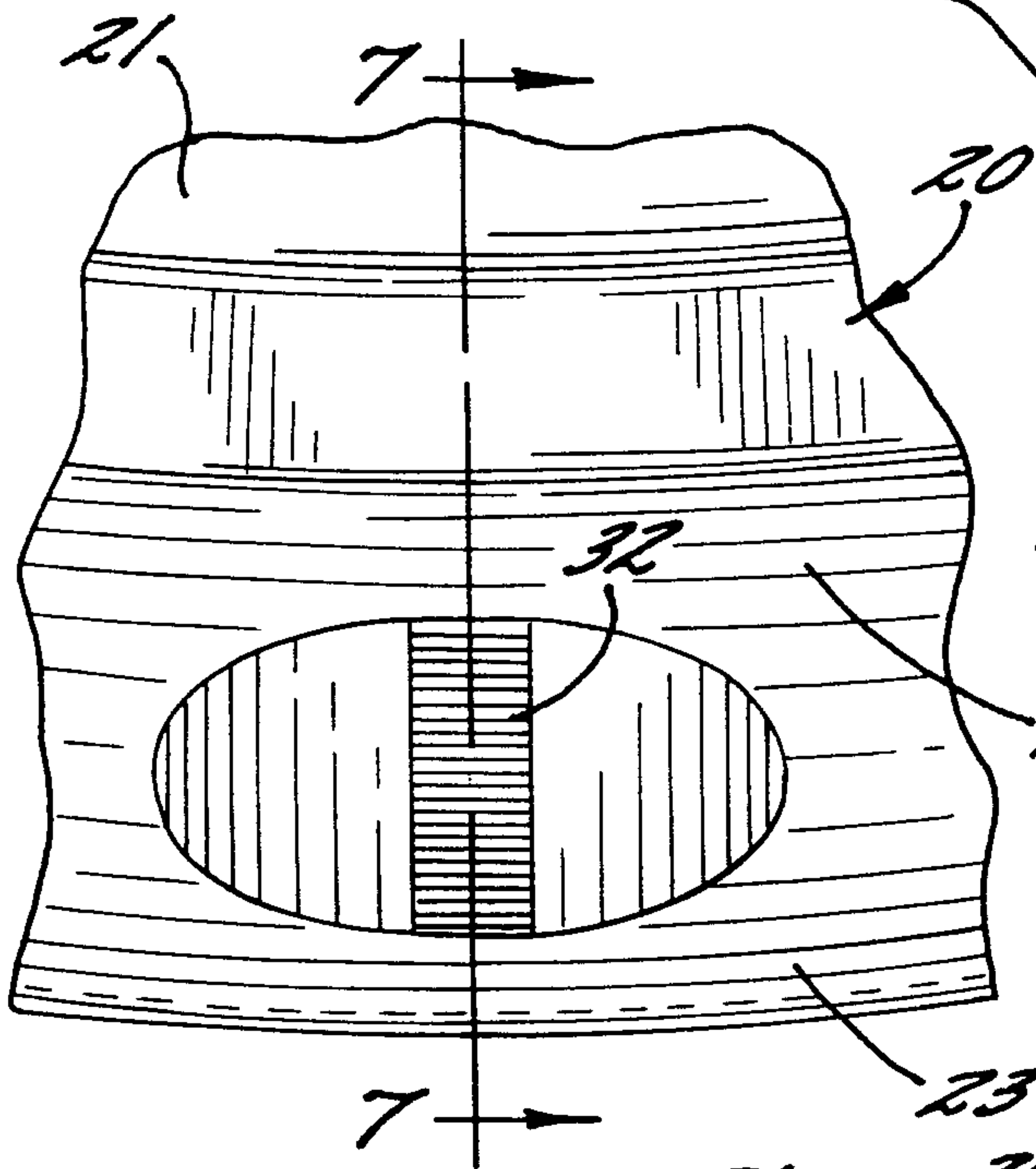


FIG. 6.

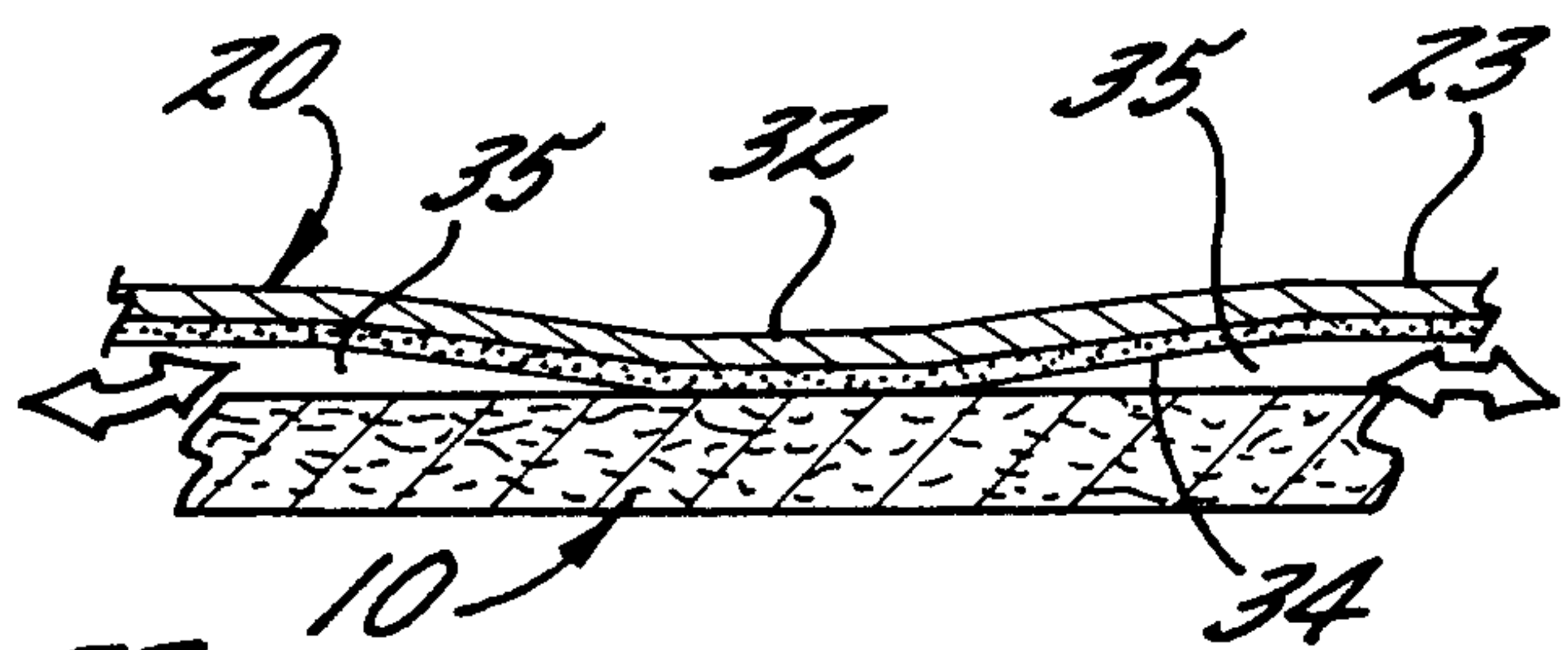


FIG. 8.

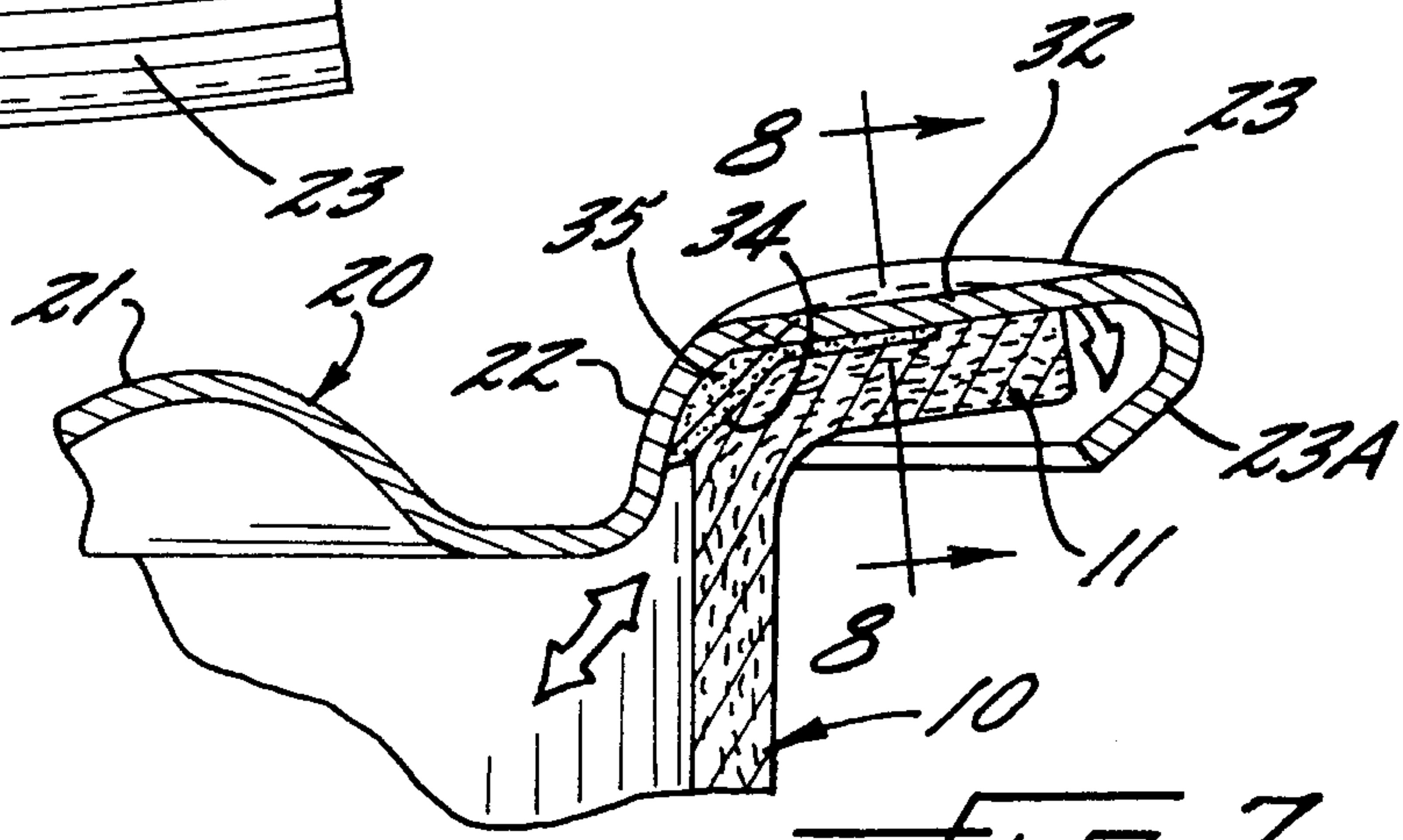


FIG. 7.

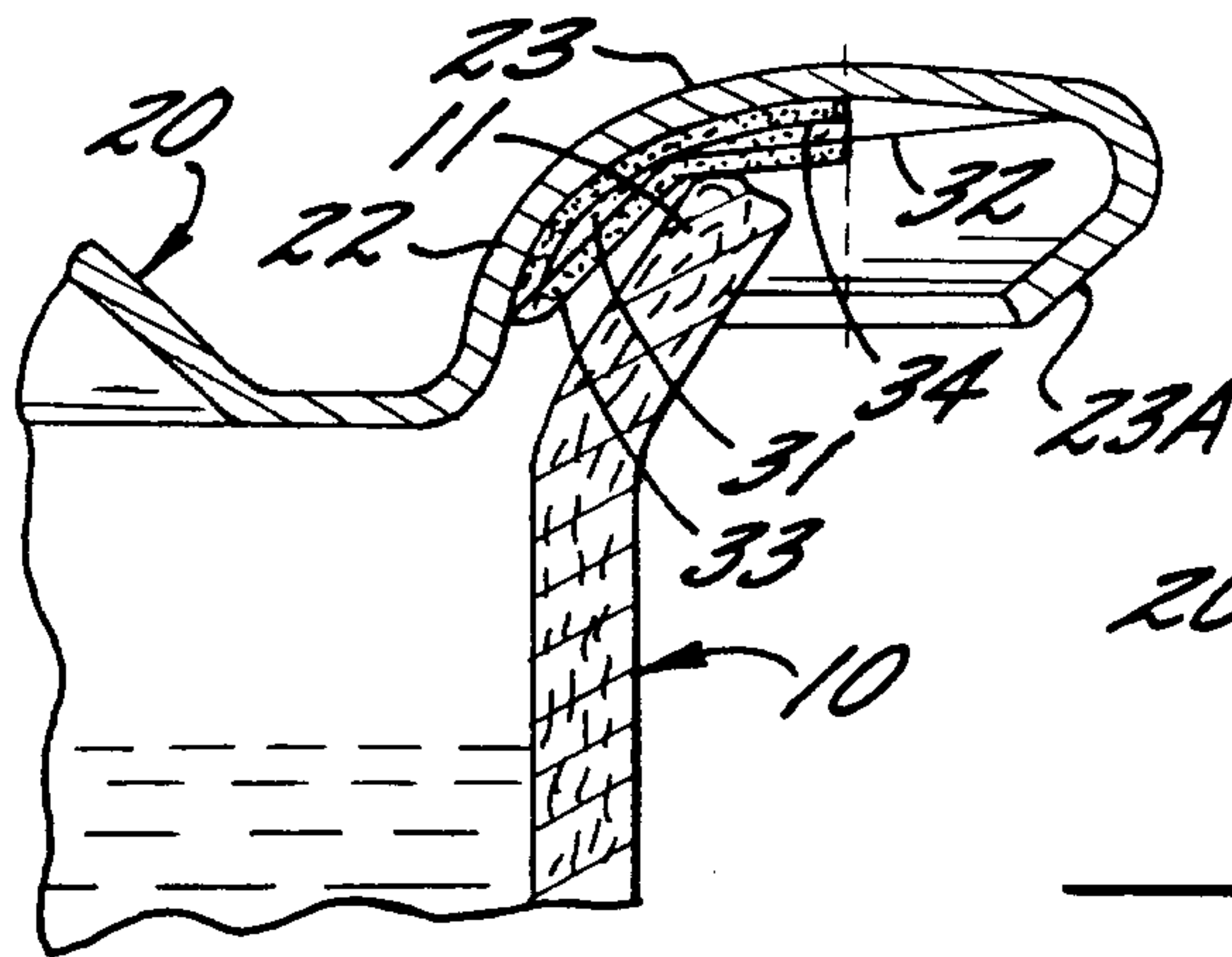


FIG. 9A.

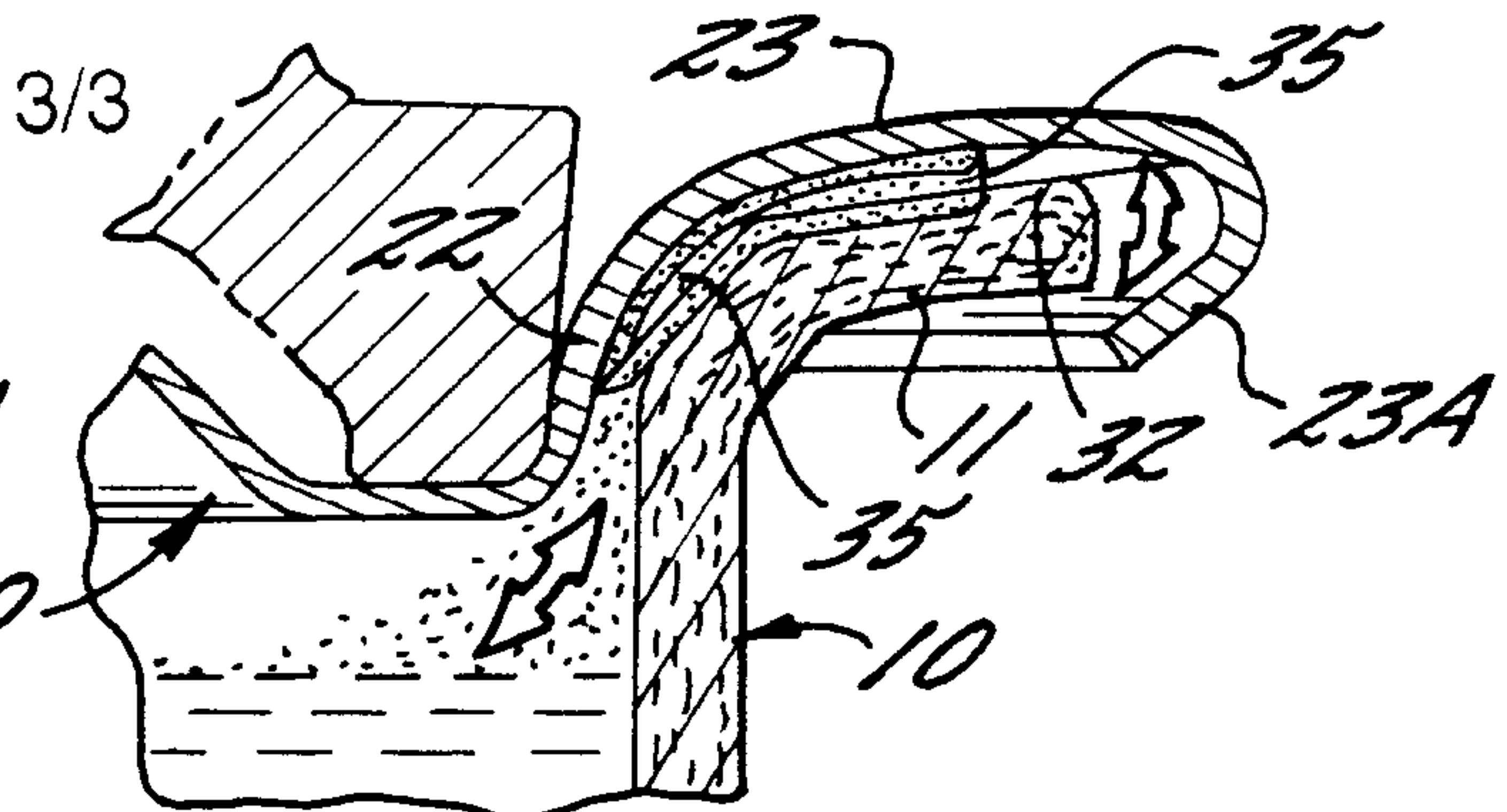


FIG. 9B.

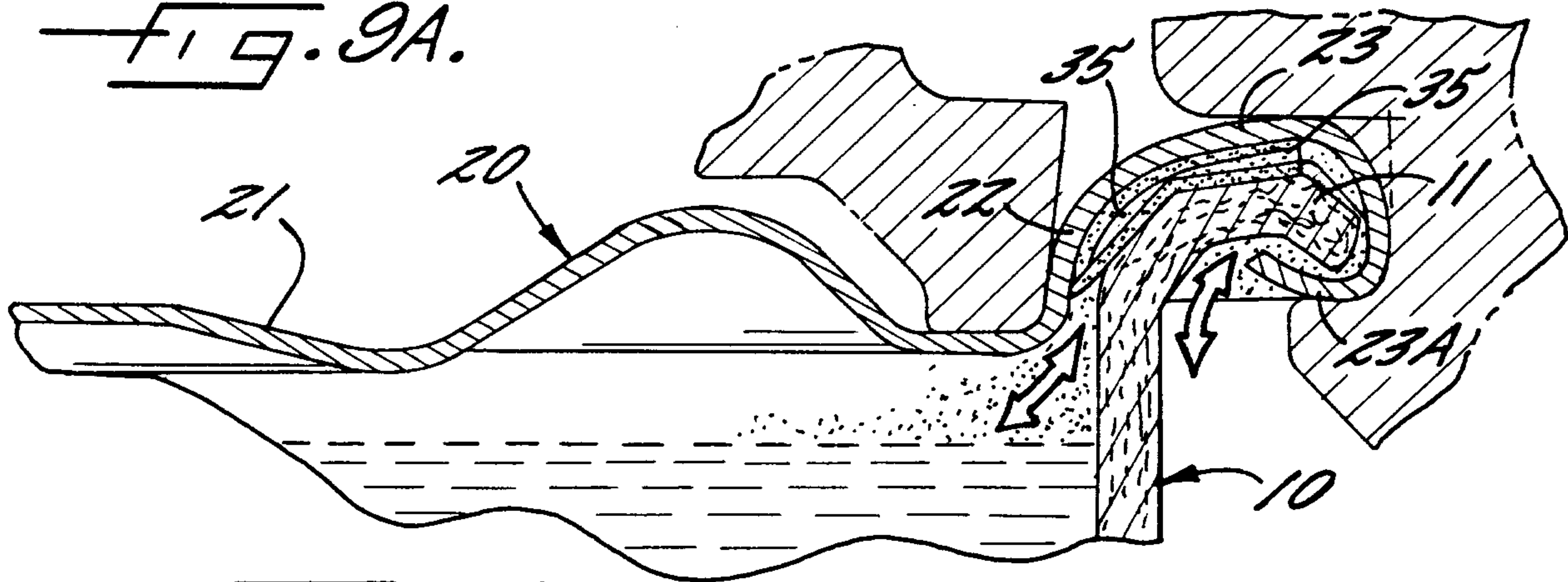


FIG. 9C.

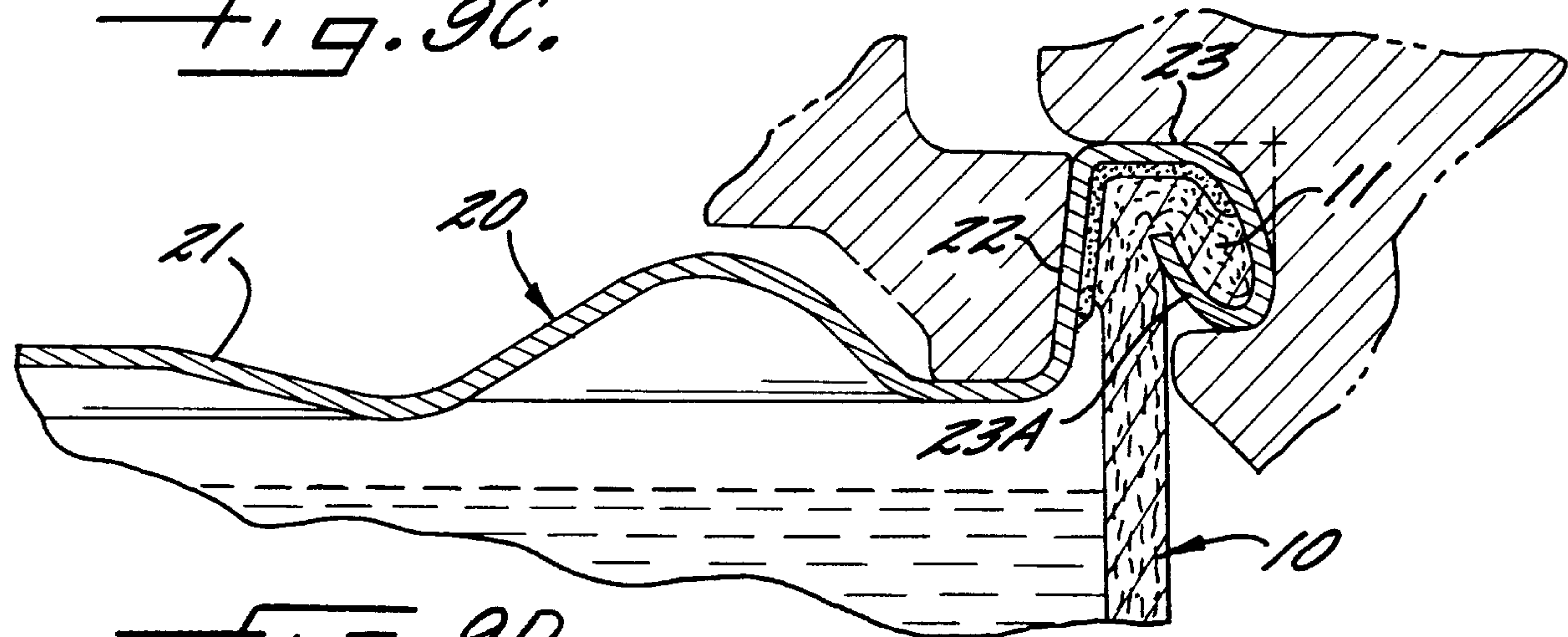


FIG. 9D.

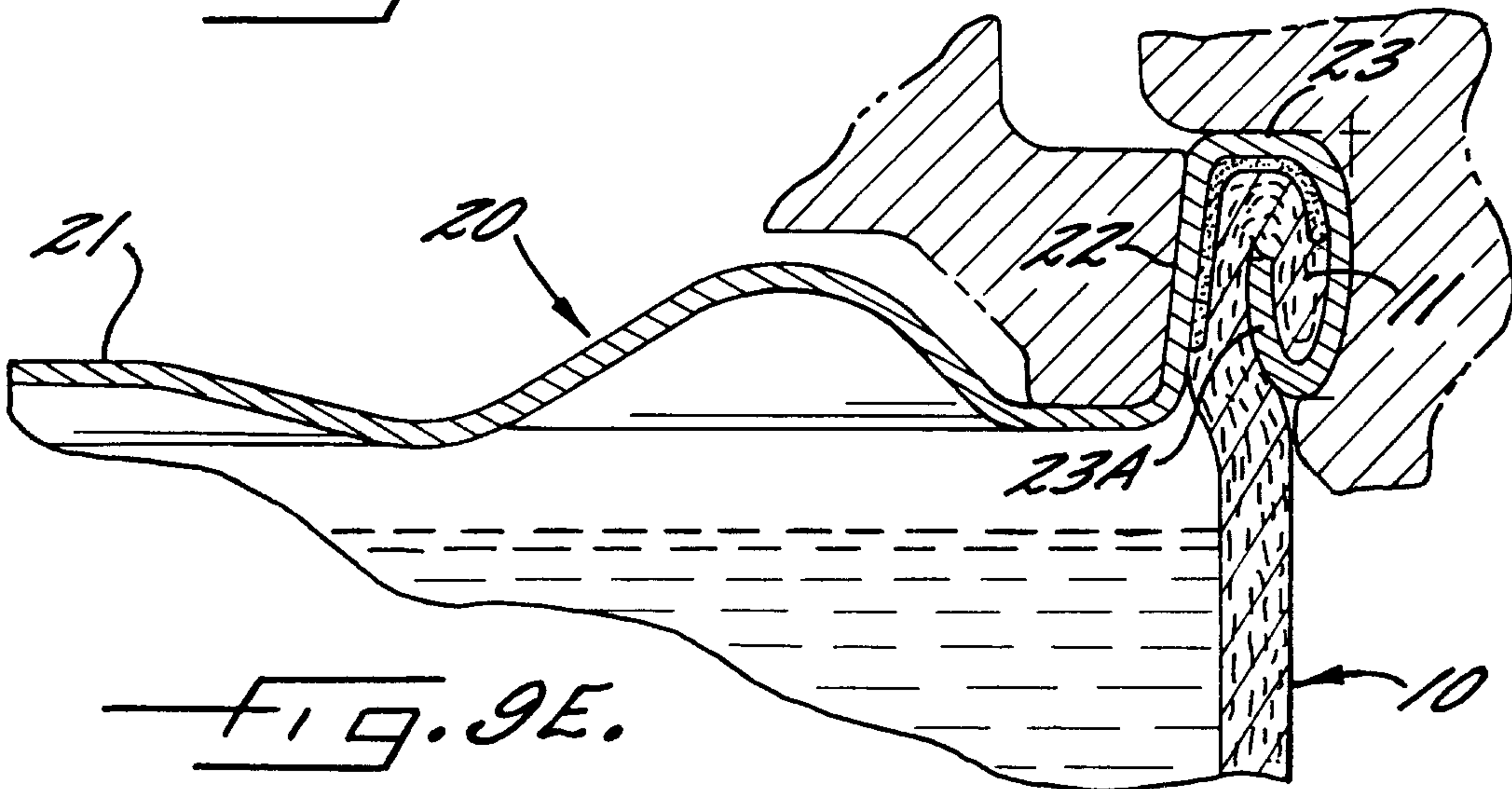


FIG. 9E.

