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2,528,419

BAG VALVE

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Fig. 1.

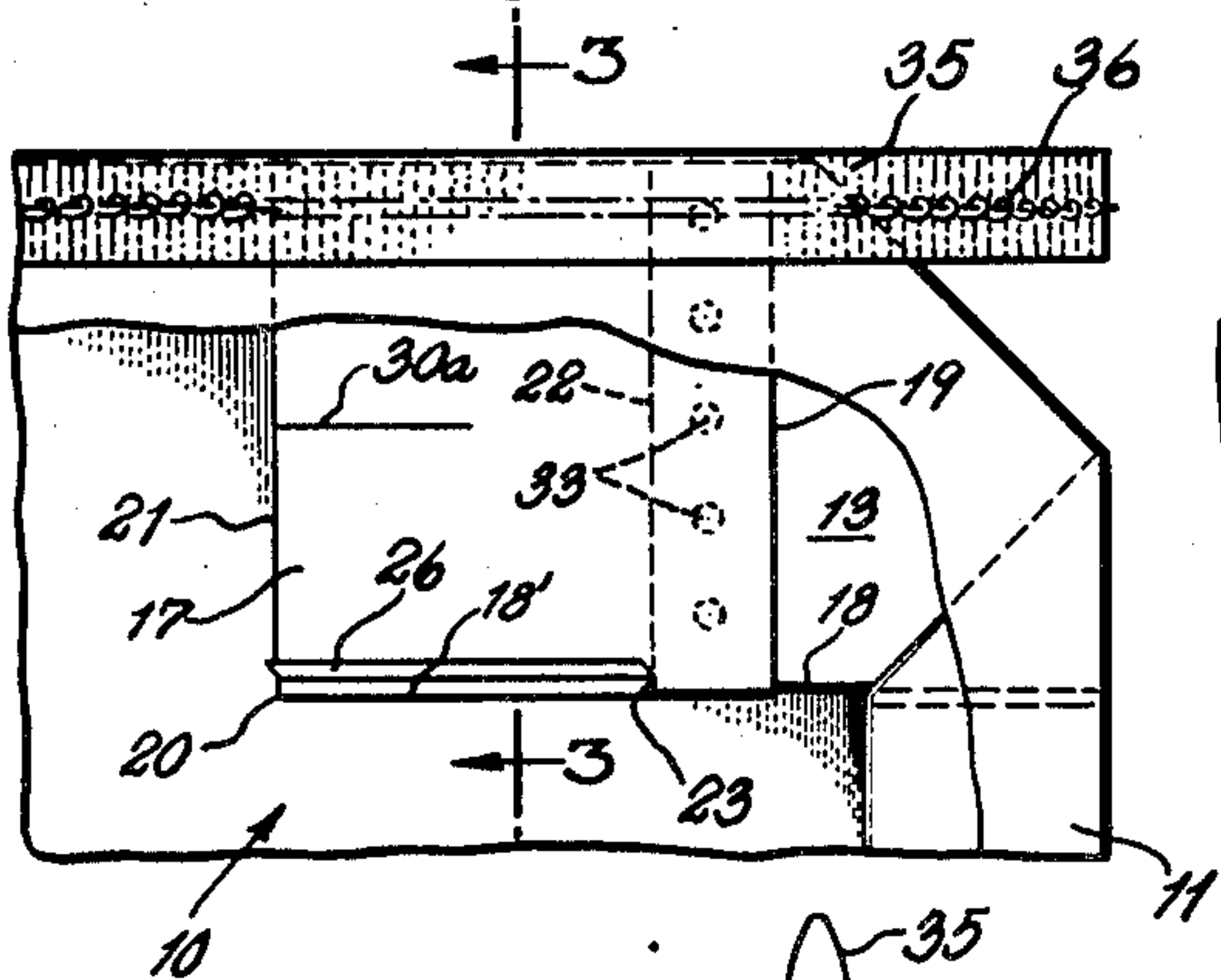


Fig. 2.

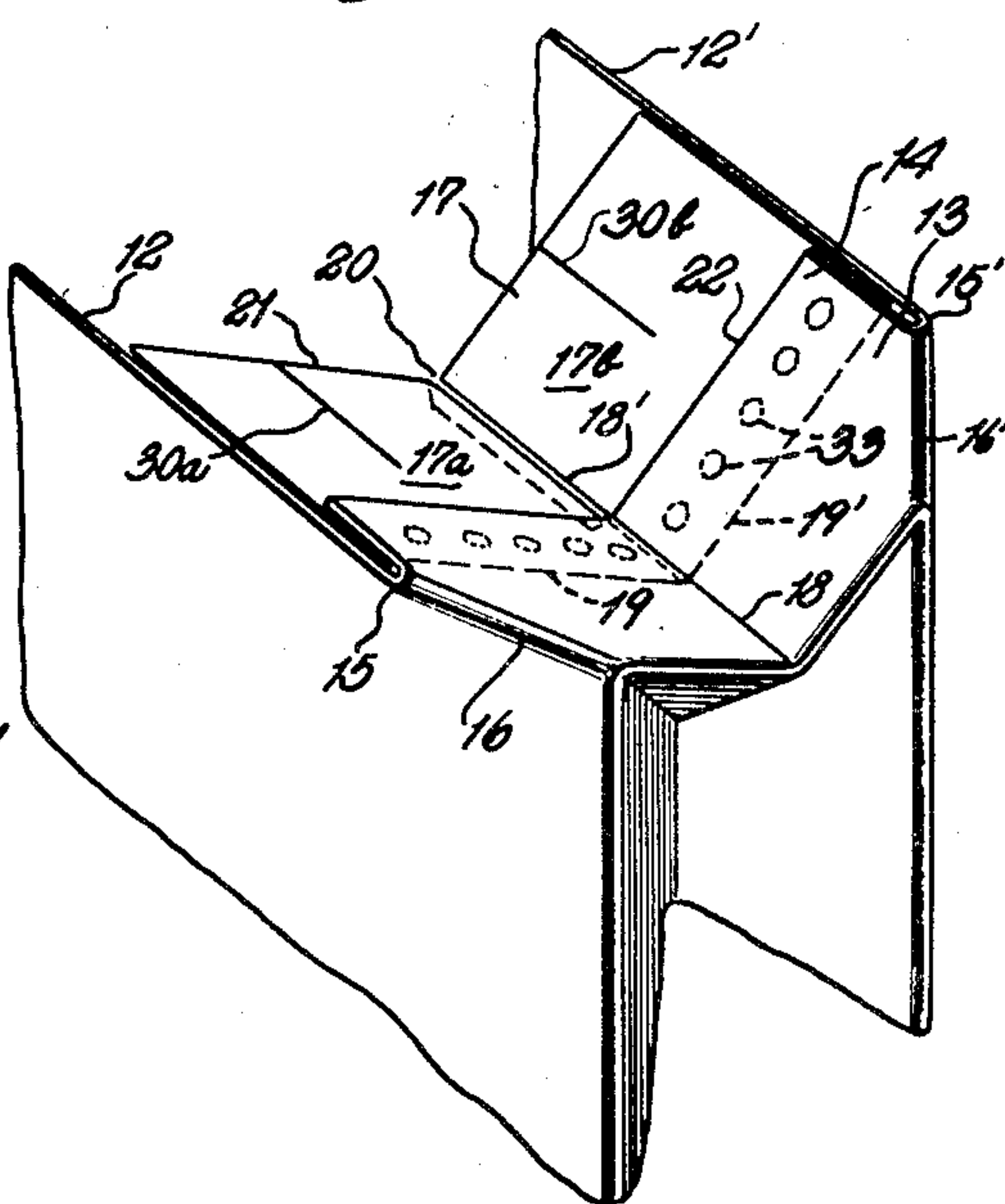


Fig. 3.

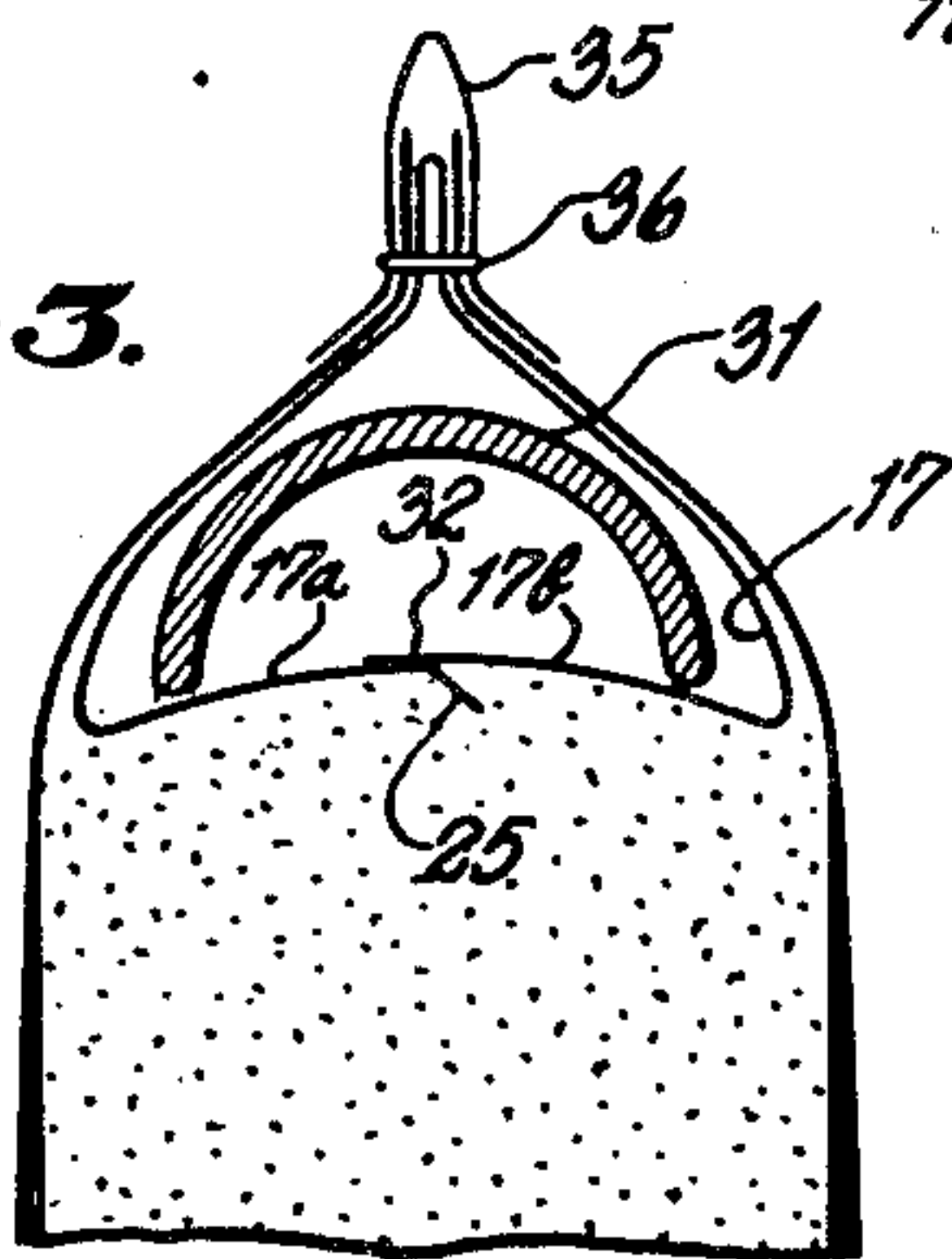


Fig. 4.

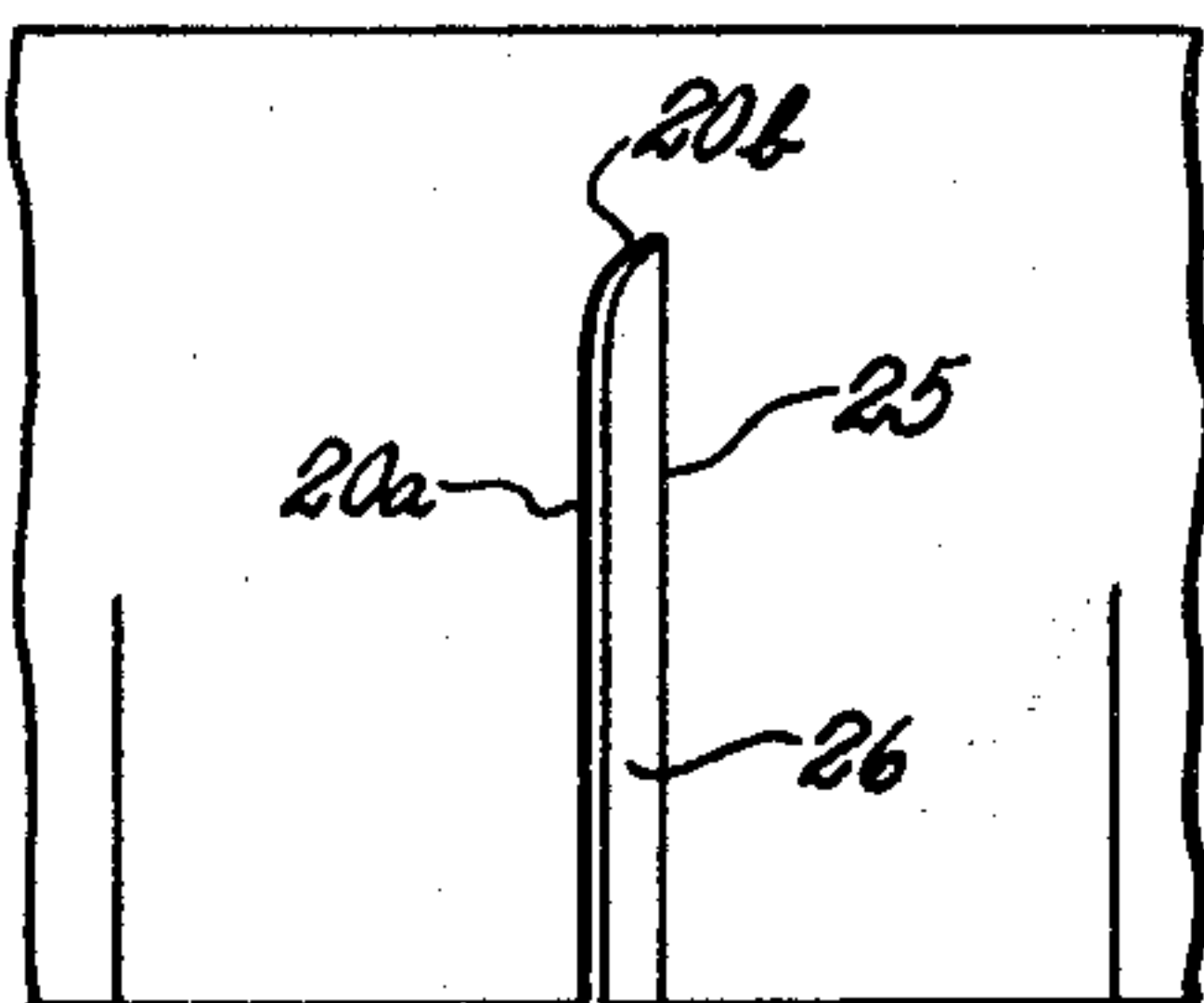


Fig. 5.

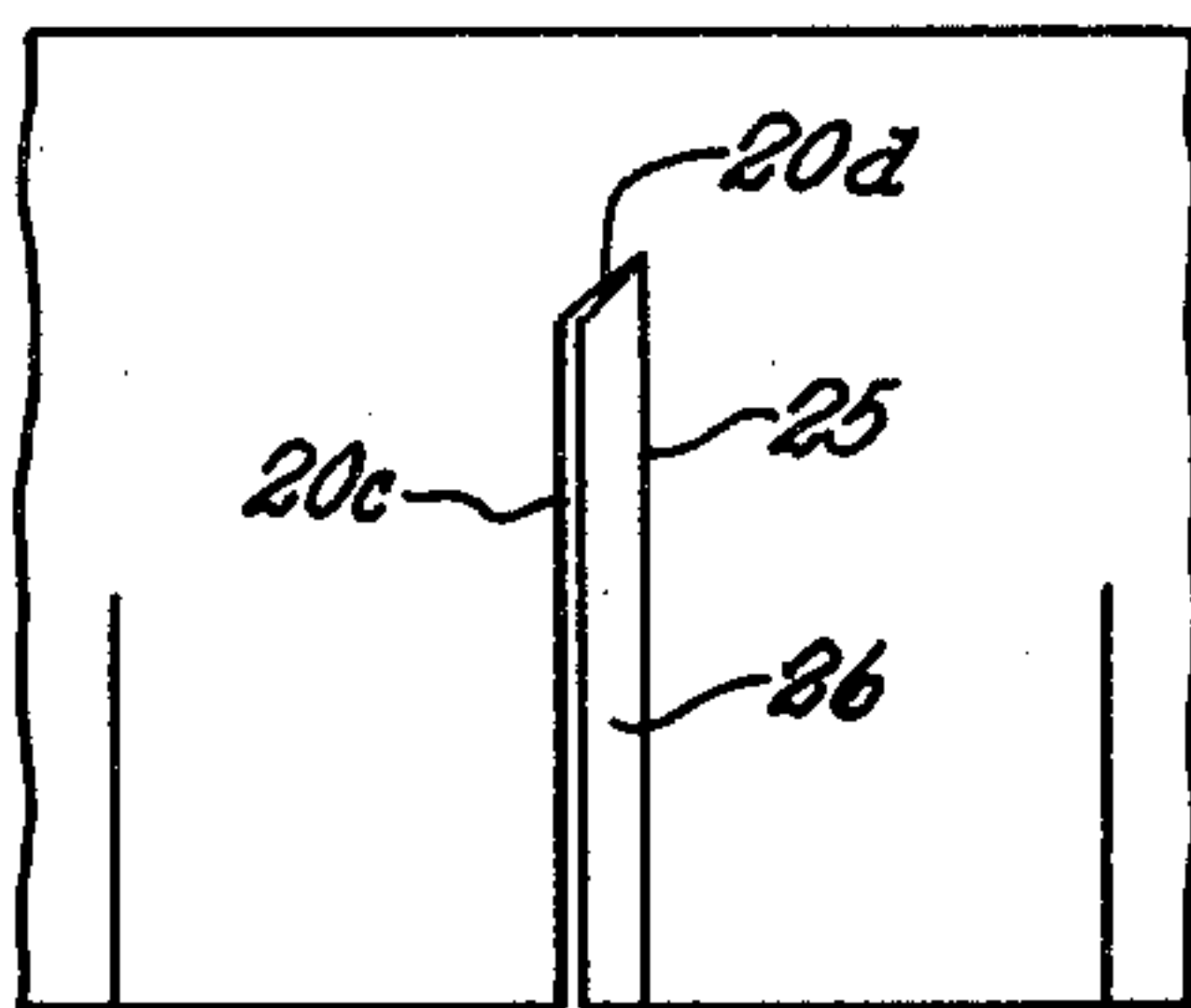


Fig. 6.

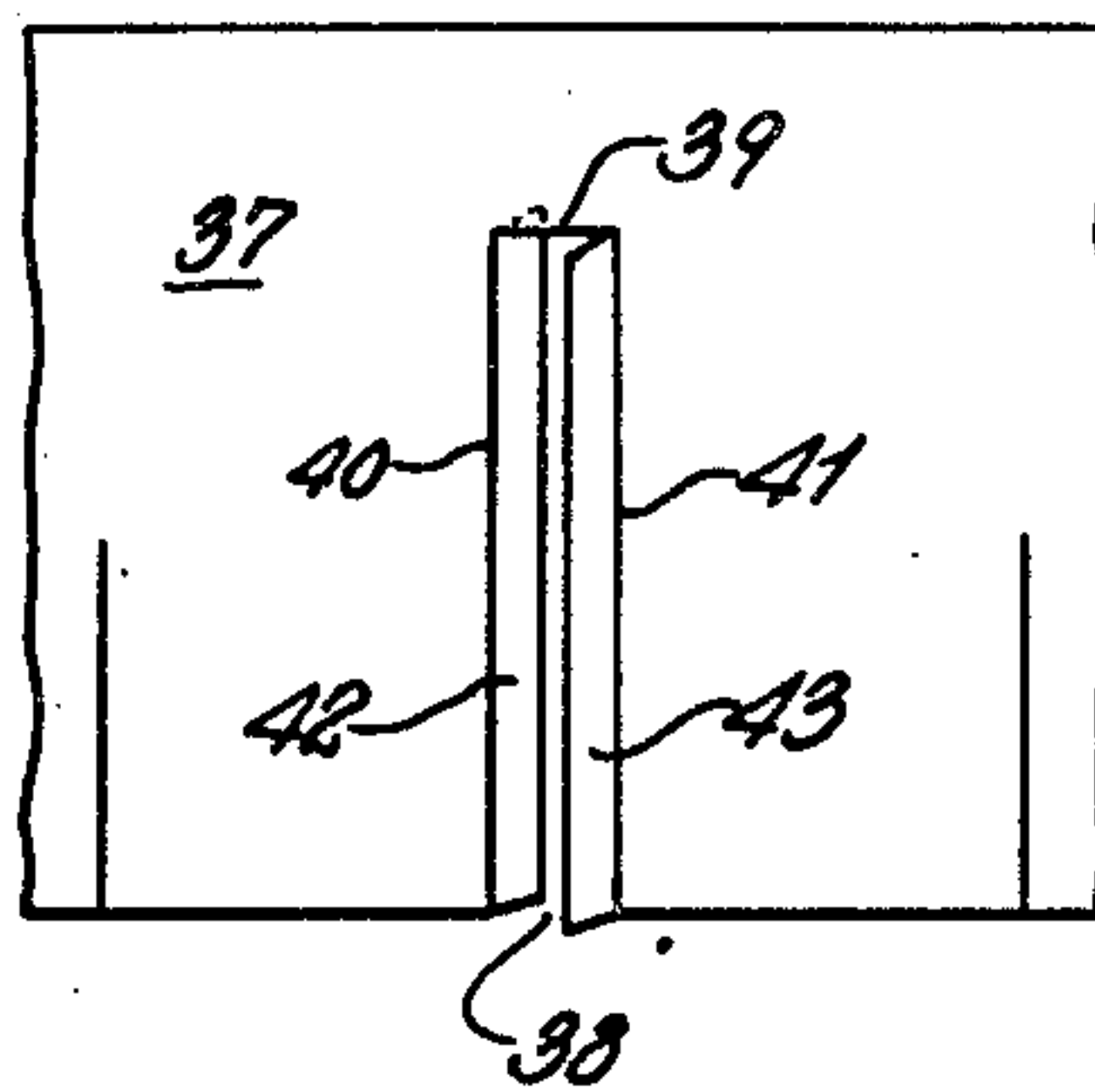


Fig. 7.

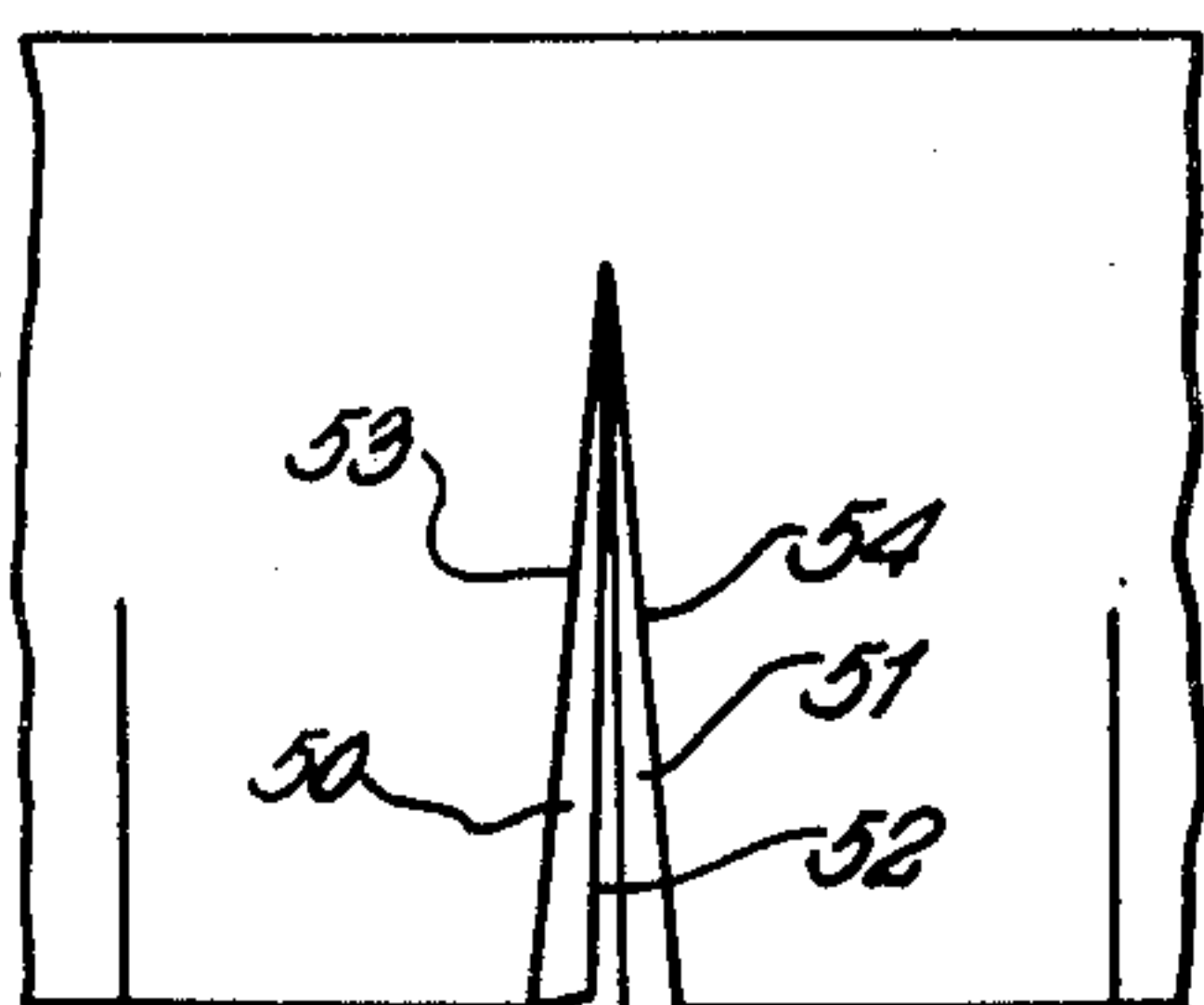
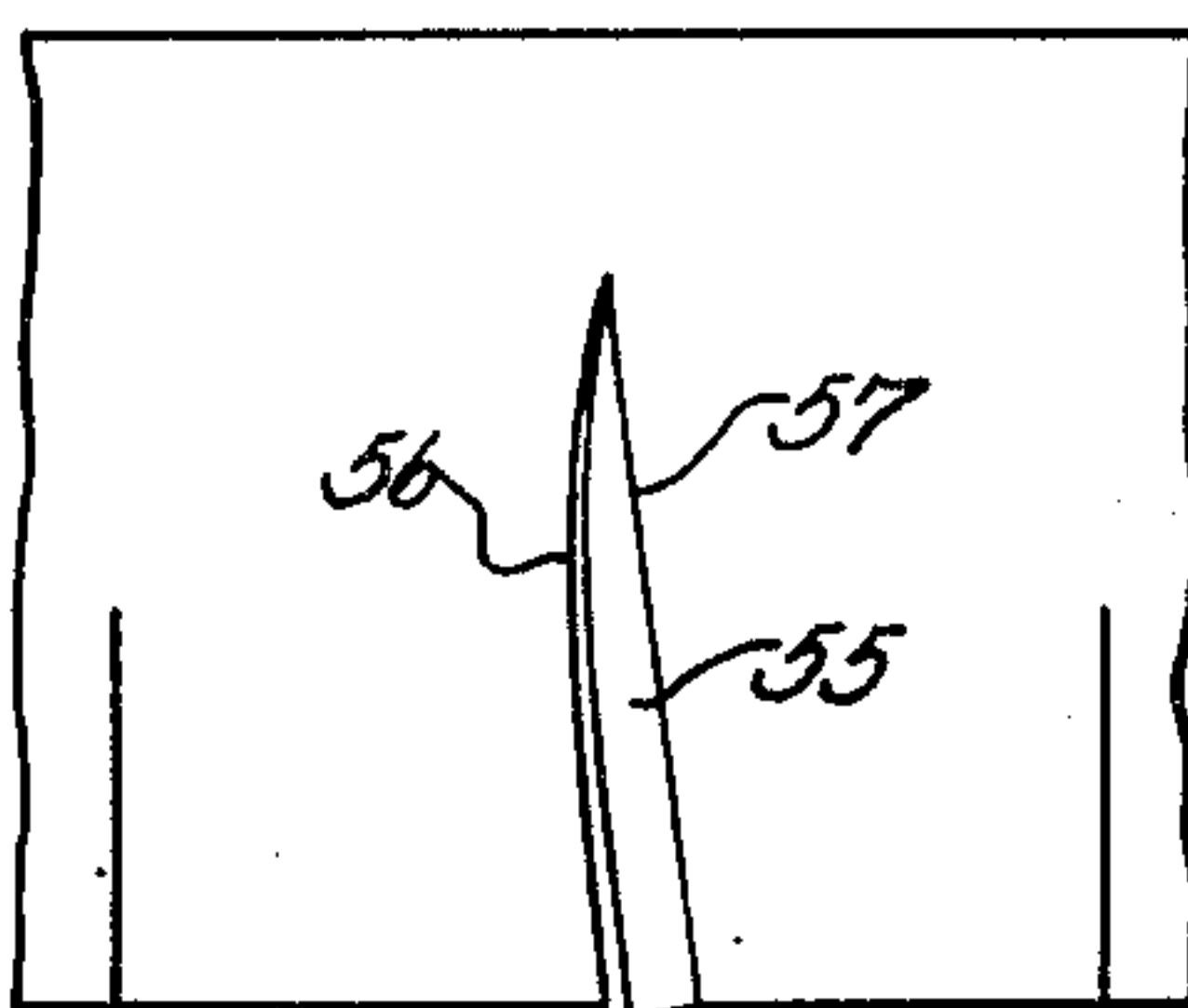


Fig. 8.



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UNITED STATES PATENT OFFICE

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BAG VALVE

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Application July 30, 1948, Serial No. 41,480

4 Claims. (Cl. 229—62.5)

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This invention relates to valve bags such as formed for example, of one or more plies of paper or the like sheet material.

The features of the invention comprise improvements upon and modifications of the general type of bag valve disclosed in United States Patent to Theron A. Contryman, No. 2,378,285, granted June 12, 1945. According to the disclosure of said patent one of the corners of a multi-ply gusseted paper bag is folded in to form a valve and the end of the bag is closed by a sewn seam. In order to provide a more effective closing action in the valve when the bag is filled, a supplemental sheet is inserted so as to provide a flexible extended valve flap protruding inwardly from the inner edge of the main multiply valve flap. When the bag is empty this supplemental sheet is so folded and creased as to form in effect a flattened tube extending inwardly of the bag, and the crease along the lower edge thereof is slitted at least part-way. Additional slits are also provided in the inner edge of the supplemental sheet at positions intermediate the upper and lower edges thereof and along the lines at which the supplemental sheet becomes folded when the bag is expanded and filled and when the contents of the bag crowd the supplemental sheet from its original vertically flatwise position, into a position flatwise up against the top of the bag to effectively close the valve. In the latter position the slit formed along the lower creased edge of the supplemental sheet is such that overlapping of the two sides of the supplemental sheet is facilitated thus avoiding irregular crushing of the extension flap with consequent incomplete closure of the valve. At the same time, the two slits in the sides of the supplemental sheet serve to define the lines of creasing of the extension flap at its sides when it is pushed up by the contents of the bag into closing position.

In order to facilitate the overlapping of the two edges of paper along the slit at which is normally the bottom edge of the folded supplemental sheet, it is desirable to form this slit of substantial width, as by forming a relatively wide saw cut or by cutting out a narrow piece as explained in said patent. This, however, has the difficulty that small pieces or narrow strips of the paper will be cut free and may find their way into the bag contents or into the mechanism used for automatically valving or sewing the bag or inserting the supplemental sheet therein. Also the slit edges may sometimes as-

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sume positions crossing each other so that they do not overlap properly.

To avoid these difficulties, in accordance with the present invention, the lower edge of the supplemental sheet or flap extension is formed with a novel type of slit having advantages superior to those of a wide slit but so formed that the paper is merely severed without cutting out any loose pieces. Adjacent the point where the supplemental sheet is secured to the main valve flap the slit preferably veers off in a slight curve or at any angle whereby the slit terminates at a point a slight distance above the lower crease line of the supplemental sheet. From this point of termination of the slit, one side of the supplemental sheet is creased along a line spaced slightly above the slit so that the lower edge of one side of the supplemental sheet is bent away from the lower edge of the other side. With such a construction it has been found that such edges will more readily assume the desired smoothly and closely overlapped positions when the bag is filled. Thus, a more certain closure of the valve is made possible without the necessity of resorting to relatively wide slits and the consequent troublesome loose pieces.

Various further and more specific objects, features and advantages will more clearly appear from the detailed description given below taken in connection with the accompanying drawings which form a part of this specification and illustrate merely by way of example, preferred forms of the invention. The invention consists in such novel features, and combinations as may be shown and described in connection with the constructions herein disclosed.

In the drawings:

Figure 1 is a side elevational view partly broken away showing the valve corner portion of a multi-ply gusseted sewn end bag embodying one example of the invention.

Fig. 2 is a perspective view of the corner portion of the same bag in partially opened condition, after the supplemental sheet or valve extension has been inserted and before the end of the bag has been sewn;

Fig. 3 is a sectional view showing the positions assumed by portions of the valve extension flap as the bag becomes filled, this view being taken along a line corresponding to that indicated at line 3—3 of Fig. 1.

Figure 4 is a plan view of one form of supplemental sheet or extension flap made in accordance with the invention; and

Figs. 5 to 8, inclusive, show alternative forms. The bag 10 as shown in Fig. 1 may be formed of one or preferably a plurality of plies of paper or like sheet material. The walls of the bag may be manufactured in the usual way in the form of flattened tubes suitably creased at each side to form gusset portions as at 11. In cutting the tubes into bag lengths, the line of severance as it extends across the greater part of the width of the bag will occur at the top edge as indicated at 12, 12' in Fig. 2. However, at the valve corner, if desired, the tubes may be severed in such a way as to provide an extension portion or so-called "notch" which after the valve corner has been folded in as at 13, will provide a flap portion as at 14 which will extend inwardly of the valve somewhat beyond the points 15, 15' where the diagonal fold lines 16, 16' of the valve intersect the lines of severance 12, 12'.

It will be noted that the in-turned corner of the bag which forms the valve portion 13 will normally have two side walls joined at the bottom along a crease 18. A supplemental sheet 17 for providing the flexible extension flap, similarly has two side walls 17a, 17b, which are also joined at 18' along the same crease. The edges 19, 19' of the supplemental sheet which are directed outwardly of the valve are preferably arranged to underlie the main flap or "notch" portion 14 of the valve and, if desired, may be secured thereto by adhesive in a manner hereinafter described.

As best shown in Fig. 2, the supplemental sheet 17 is slit along a line 20 which comprises a continuation of the crease line 18', such slit extending preferably all the way from the inner edge 21 of the supplemental sheet back to approximately the edge 22 of the main flap portion 14. This slit 20 at its inner end preferably terminates in a short angularly directed slit which may be positioned, for example, as shown at 23 in Fig. 1 at a right angle with respect to the main slit 20, or if preferred, as shown in Fig. 4, the main slit as at 20a may terminate in a portion as at 20b which veers off along a short arc. Alternatively, as shown in Fig. 5, the main slit as at 20c, may terminate in a portion as at 20d positioned at an angle, for example, 45° with respect to the slit portion 20c. With all of these forms, the supplemental sheet is preferably creased along a line as at 25 (Figs. 4, 5) extending in generally parallel relation to the main slit and somewhat spaced therefrom so as to form a narrow flap-like portion as at 26 which is deflected preferably inwardly of the bag.

The side walls 17a and 17b of the flexible extension flap may also be slitted as at 30a, 30b along lines positioned about midway between the upper and lower edges of the extension flap, that is, along the lines at which the extension flap will be creased when it is flattened up against the top of the bag as the bag is being filled and as the pressure of the contents changes the extension flap from a vertically flat-wise shape, to the shape shown approximately in Fig. 3, wherein the inner upper end portion of a filling spout is indicated in section at 31. As will be seen from Fig. 3, when the extension flap is in this position, the edges of the paper at each side of the slit 20 will assume overlapping positions as indicated at 32 and in the usual case, the narrow downwardly bent flap portion 25 will protrude inwardly of the bag and because of its being flexed downwardly, it will slide past the other edge of the paper

at the slit 20 without catching thereon or causing wrinkling which would prevent proper closing action.

The supplemental sheet may be inserted by hand when the valve parts of the bag are partially opened to the position shown in Fig. 2 or, if desired, mechanism which forms no part of the present invention may be provided for automatically performing this operation.

As above indicated, the part of the supplemental sheet which underlies the main valve flap portion 14 is preferably secured by adhesive to the latter. Preferably, such adhesive may be initially applied to the supplemental sheet in the form of a series of small spaced areas as indicated at 33 (Figs. 1 and 2). These spots of adhesive may be applied, for example, by automatic means during or as part of the operation of cutting the extension flap piece to the desired shape. The use of a series of separate spots of the adhesive in this way has the advantage that the number of spots thus automatically applied may be readily varied depending upon the dimensions of the particular supplemental sheet being used. That is, a number of the spots may be used such as will provide secure adhesion at spaced intervals but without any adhesive occurring at the top edges of the supplemental sheet where the glue (if it were in the form of a continuous band) might smear and interfere with convenient cutting of the sheet or its assembly and securement in place in the valve of the bag.

After the supplemental sheet 17 is in place as shown in Fig. 2, the top edges of the bag may be brought together and a reinforcing strip 35 formed, for example, of creped paper of U-shaped cross section, may be placed astride the top edge whereupon the top edge may be closed by a sewn seam 36. From Fig. 1 it will be apparent that the stitches of this seam will pass through the top edges of the supplemental sheet 17 thereby providing a strengthened construction along the top corner of the bag where the weight of the bag may rest upon a filling spout when inserted into the valve. Also, it will be apparent that this sewn seam acts to securely retain the supplemental sheet in position free of irregular wrinkles when the bag is filled.

With the alternative form of the invention shown in Fig. 6, an extension flap 37 is slitted at 38 along a line comparable to the line of the slit 20 in Fig. 1. This slit at its inner end is terminated by a short transverse slit 39 extending to either side of slit 38. Then the paper is creased along two lines, 40 and 41, at either side of and spaced from slit 38 so as to form two narrow flaps 42 and 43, one of which may be bent upwardly and the other downwardly. With this construction, the edges of the narrow flaps 42 and 43 being bent in opposite directions will be initially spaced a sufficient distance apart so that further insurance is given against the possibility of the two edges coming into engagement during the final closing operations. Of course, if preferred, instead of using a short straight slit as at 39, slits to either side as at 20b and 20d in Figs. 4 and 5 might be used.

Further embodiments with which certain advantages of the invention may be obtained are indicated in Figs. 7 and 8, wherein the short transverse slitting is avoided. That is, in Fig. 7 two of the narrow flaps are provided as at 50, 51 by creasing the paper at the side of the central slit 52, along slightly diagonal lines as at 53, 54. In Fig. 8 a single narrow flap is provided

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at 55 by forming the central slit 56 along a slight arc and by forming the line 57 at a slight angle with respect to the crease line 18 of the valve.

This application comprises a continuation-in-part of applicant's copending application Serial No. 650,775, filed February 28, 1946, now abandoned.

While the invention has been described with respect to certain particular preferred examples which give satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. A bag formed of thin sheet material, comprising a normally flattened tubular body portion with a corner turned in to form a valve, and having a supplemental sheet extending inward from said inturned corner to form a flexible valve extension flap, said sheet being normally folded along a crease line which constitutes the lower edge of the valve flap when the bag is empty, the sheet being slit substantially along the line of such crease from the inner edge of the extension back for a substantial distance toward the outside of the valve, the slit then veering off for a short distance to one side of the line of such crease, said flexible extension flap at said side of said slit being also formed with a crease line extending generally parallel to the main portion of said slit and spaced a short distance therefrom, whereby such side of the extension flap along its lower edge is deflected from the plane of the adjacent part of the flap and whereby when the extension flap portions are flattened toward the top of the bag upon filling of the bag, the edges of the material along the opposite sides of said slit will slide into overlapping relation.

2. A bag formed of thin sheet material, comprising a normally flattened tubular body portion with a corner turned in to form a valve, and having a supplemental sheet extending inward from said inturned corner to form a flexible valve extension flap, said sheet being normally folded along a crease line which constitutes the lower edge of the valve flap when the bag is empty, the sheet being slit substantially along the line of such crease from the inner edge of the extension back for a substantial distance toward the outside of the valve, said slit then terminating in a short cut or cuts extending to either side thereof, said flexible extension flap at either side of said slit being formed with crease lines extending generally parallel to and spaced a short distance from said slit to form narrow flap portions, one of which is deflected upwardly and the other downwardly, whereby when the extension flap portions are flattened toward the top of the bag upon filling the bag, the edges of the material along the opposite sides of said slit will readily slide into overlapping relation.

3. A bag formed of thin sheet material, comprising a normally flattened tubular body portion

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with a corner turned in to form a valve flap centrally creased to form its normally lower edge, a sewed seam extending along and securing together in closed relationship the top edges of the bag and acting also to secure together the top edges of said valve flap, and a supplemental sheet folded to form in effect a flattened sleeve within the valve and extending inwardly thereof to form a flexible valve extension, the edges of the sheet forming the upper edge of the flattened sleeve being secured by said sewed seam and the fold line which constitutes the lower edge of said flattened sleeve being substantially in alignment with the lower creased edge of the valve flap, said sleeve being slit substantially along its lower edge from the inner end of the sleeve back for a substantial distance toward the outside of the valve to a slit extremity intermediate the inner and outer ends of the sleeve, the material of the sleeve at one side of said slit being creased to form a narrow flap portion deflected from the plane of the remainder of the sleeve along a line extending from said slit extremity to the inner end of the sleeve at a point spaced a short distance from the slit, whereby when the sleeve is flattened toward the top of the bag when the latter is filled, the edges of the material along the opposite sides of said slit will be slightly spaced apart and will thus freely slide into overlapping relation.

4. A bag formed of thin sheet material, comprising a normally flattened tubular body portion with a corner turned in to form a valve, and having a supplemental sheet extending inward from said inturned corner to form a flexible valve extension flap, said sheet being normally folded along a crease line which constitutes the lower edge of the valve extension flap when the bag is empty, the sheet being slit substantially along the line of such crease from the inner edge of the extension flap back for a substantial distance toward the outside of the valve to an inner terminal point of the slit, said flexible extension flap along at least one side of said slit also being formed with a crease line extending from the inner terminal point of the slit and slightly angularly to the main portion of said slit to the inner edge of the extension flap whereby a portion of the extension flap having said crease is deflected from the plane of the adjacent part of the flap, and whereby when the extension flap portions are flattened toward the top of the bag upon the filling of the bag, the edges of the material of the extension flap along opposite sides of the slit will slide into overlapping relation.

EDWIN E. BURROUGHS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,503,516	Porter	Aug. 5, 1924
2,040,336	Rosmait	May 12, 1936
2,378,285	Contryman	June 12, 1945
2,418,975	Johnson	Apr. 15, 1947