

Oct. 17, 1939.

E. HOPPE ET AL

2,176,499

MULTIWALL BAG OF PAPER OR OTHER MATERIAL

Filed Nov. 27, 1936

3 Sheets-Sheet 1

FIG. 1.

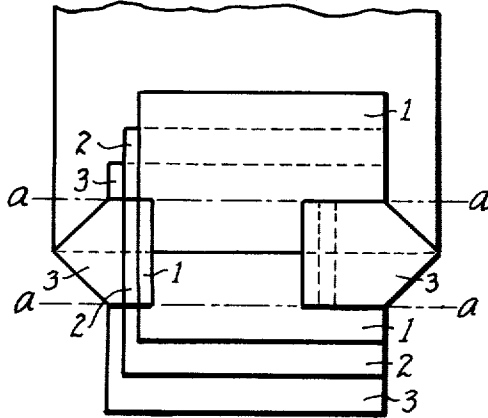


FIG. 2.

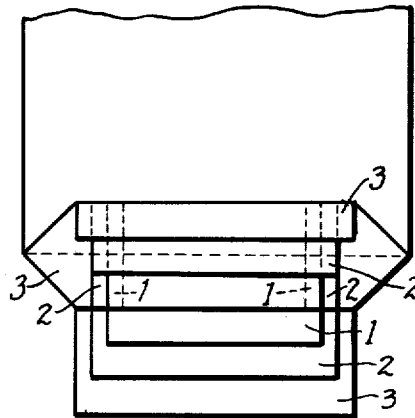


FIG. 3.

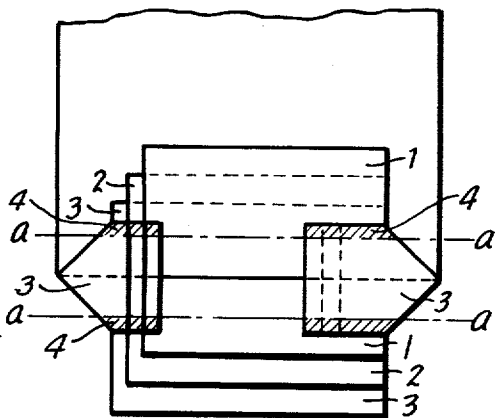
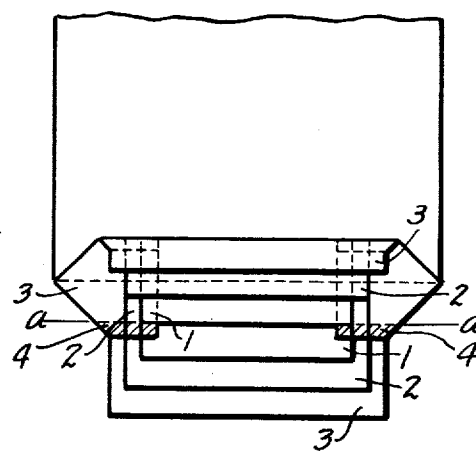


FIG. 4.



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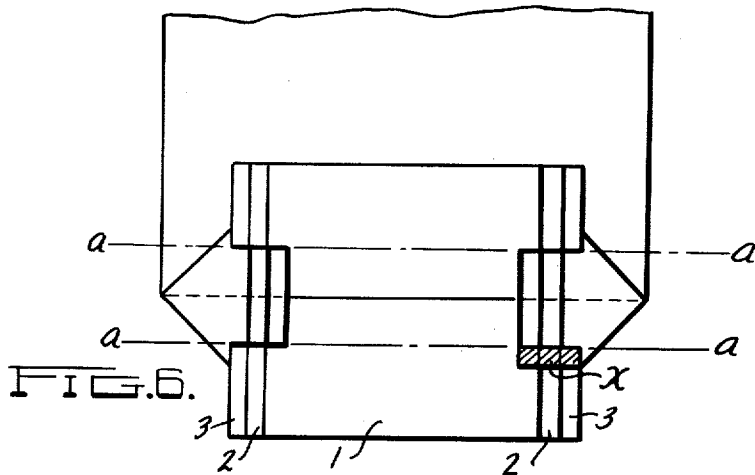
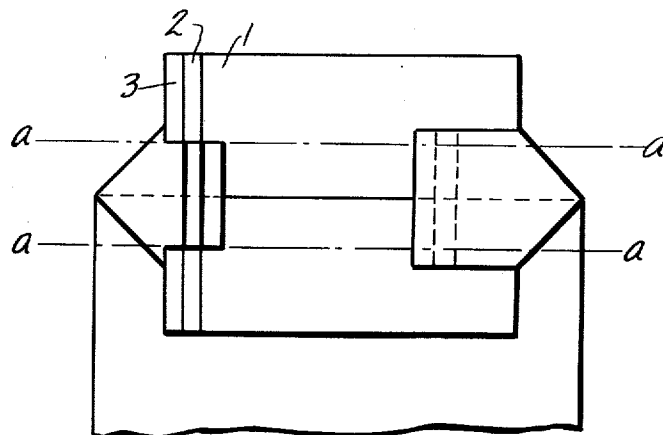
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MULTIWALL BAG OF PAPER OR OTHER MATERIAL

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3 Sheets-Sheet 2

FIG. 5.



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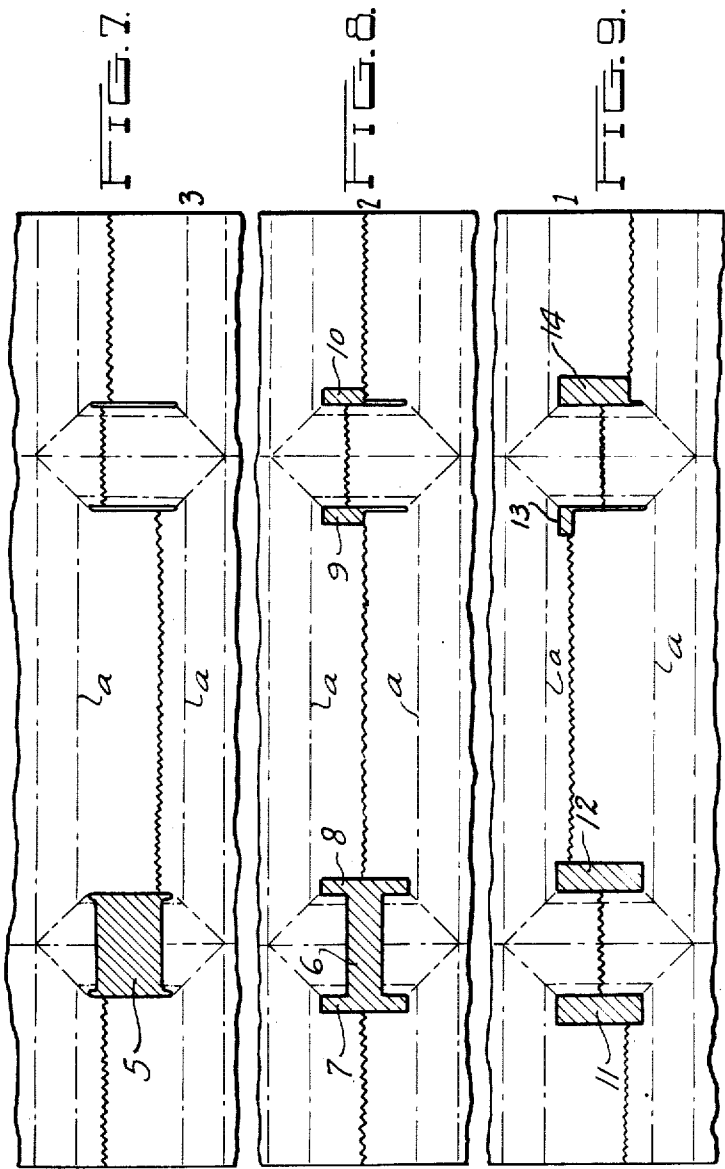
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MULTIWALL BAG OF PAPER OR OTHER MATERIAL

Filed Nov. 27, 1936

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,176,499

MULTIWALL BAG OF PAPER OR OTHER MATERIAL

Edgar Hoppe, Amsterdam, Netherlands, and Klas Johnsson, Oerebro, Sweden; said Johnsson assignor to said Hoppe

Application November 27, 1936, Serial No. 112,876
In Germany November 28, 1935

9 Claims. (Cl. 229—55)

The invention applies to improvements in multiwall bags of paper and/or other material with end closure formed by independent side and end flaps and has for its purpose to primarily reinforce those spots of the bag which are weaker than the other at the same time being mostly exposed to strain, i. e. the corners of the bag.

This result is obtained by a special corner construction which may be applied to one or several corners of a valve bag or open mouth bag, said construction consisting therein, that the side and end flaps are stepped in coordination with one another and pasted together with at least the corresponding step.

This corner construction consists preferably in end flaps the edges of which in one direction and side flaps stepped adjacent to the respective corner are stepped in opposite direction with the effect that steps of various plies come to lie at least on one opposite step at the respective corner and are pasted with it.

This construction of the corner can be applied to all kinds of multiwall bags independent of their structure without difference as to whether these bags are stepped or unstepped in themselves.

The practical execution of this construction can require more or less an elimination of parts of the material which might otherwise interfere with the pasting of the steps with one another.

This material can be used according to an idea of the invention for the extension and thus reinforcement of the valve flap and valve corner.

The advantages obtained by the invention are manifold, of which the most important ones shall be enumerated as follows:

(1) Bag corners constructed according to the invention give the best guarantee of strength by securing a complete pasting.

(2) The strength of the respective corners rises with the requirements by a corresponding increase of the number of pasted seams with the increase of the number of walls.

(3) Notwithstanding a very complete and secure pasting of the corner the ends of the bag remain flexible, the accumulation of adhesive otherwise usual being limited.

(4) The better distribution of the glue avoids also the danger of the material becoming brittle after drying.

(5) The drying of the bag itself is thereby simplified and urgent deliveries are freed from the danger of unsufficiently dried pasting.

(6) The strength of the construction of the bag corners makes it possible to economize ma-

terial by reducing the overlapping of the flaps at the ends of the bag. In case of a bag stepped in itself an economy can be derived in reducing the width of the respective steps.

(7) It is also possible to reinforce conveniently the valve corner respectively the valve flap on account of the superfluous material derived from the stepping adjacent to the corners.

(8) The above mentioned extension of the valve flap can be produced integrally if the bag is made of portions of a continuous tube by making the said extension from the superfluous material of the opposite stepped corner of the adjacent portion of the tube.

(9) The construction of stepped end flaps as well as sideflaps counterstepped adjacent to the corners makes it possible to manufacture interleaved bags with very strong bottoms in which only the side flaps are interleaved, no interleaving of end flaps being necessary due to the pasting of the step of each ply of the end flaps to at least the step of the corresponding ply of the side flaps. This facilitates substantially the procedure of manufacturing interleaved bags without sacrificing in any way the strength of the interleaved bottom.

These and other advantages of the invention will become entirely clear on the basis of the attached drawings which will now be described in detail.

These drawings show substantially the application of the invention to two main types of bags, i. e.

Figs. 1 to 4 refer to bags stepped in themselves, whereas

Figs. 5 and 6 demonstrate the application of the invention to unstepped bags.

Fig. 7 illustrates the manner of dividing a sheet to form flaps for the outer ply of a bag, while Figs. 8 and 9 are similar views with respect to the intermediate and inner plies, respectively.

The drawings indicate furthermore variations in the width of the end flaps in relation to the position of the folding lines *a—**a* indicating thus also some variations in the parts of material which might be eliminated as far as they prevent the proper pasting of the steps to one another.

A portion of material which might be eliminated is indicated by dashes and marked with *x* on Fig. 6. Such portions of the material are available also at the bag corners of the modification of the bag construction demonstrated in Figs. 3 and 4 whereas the modification illustrated in Figs. 1 and 2 has no such portions of material at the end flaps, the cuts of the end flaps coincid-

ing in this instance with the folding lines *a-a* of the bag bottom.

Needless to say that the dashed portions of material in Figs. 3 and 4 can even prove of importance, i. e. at the valve corner for a certain reinforcement of the valve flap.

In Figs. 1, 3 and 5 the side flaps of a prefolded bag bottom have been reopened so as to show one of the possible co-ordinations of the steps of end flaps with countersteps of the side flaps.

In the illustrated case the end flaps to the left are staggered from the inside to the outside with the effect that the inner ply of the end flap has the longest, the outer ply of the end flap the shortest step, whereas the side flaps show a stepping in opposite direction, i. e. the shortest step of the side flaps belongs to the inner, the longest step to the outer ply. The order of the plies is indicated by numbers 1, 2, 3 from the inside to the outside on all attached drawings.

As to the end flap at the right the Figs. 1, 3 and 5 show an elongated valve flap. The marked extension is designed in the supposition that the respective bags are made of portions of a continuous tube in which case the extension can be derived integrally from the material eliminated from the opposite stepped end flap. This is the reason why in the illustrated case also the elongated valve flap is stepped, this stepping running in contrary direction to the formerly mentioned one.

The Figs. 2, 4 and 6 show a non-valve end of a valve bag or bottom of an open mouth bag constructed according to the invention. In Figs. 2 and 4 the side flaps at the top have been folded over the end flaps in order to demonstrate how the steps might come to lie on one another in a ready pasted bag. Obviously that also another folding and pasting is possible in which the end flaps are folded over the side flaps. This would require only a rearrangement of the steps in contrary direction without deviating from the principle of the invention.

Figs. 1, 2, 3, 4 and 7 illustrate the application of the invention to bags stepped in themselves, i. e. the side flaps of which are stepped also in longitudinal direction whereas Figs. 5 and 6 demonstrate a bag with stepped end flaps and counterstepped side flaps, the side flaps not being stepped longitudinally.

Fig. 7 illustrates a method of cutting an outer ply of a bag. The sheet shown may be folded and its edges pasted together to form the bag and it will be readily understood that the cutting indicated may be performed either before or after the folding into tube form, or partly before and partly after, as desired, the sheet being shown unfolded in the drawings for purposes of illustration. The end of the ply shown below the cross cut is adapted to form a closure such as illustrated in Fig. 1, while the end of the ply shown above the cut is adapted to form a closure such as disclosed in Fig. 2, Figs. 1 and 2 being arranged, however, to show in each instance the short outer ply of the side flap in the upper portion. It will be readily seen that the portion 5 at the left of Fig. 7 may be cut away as each of the end flaps of the outer plies is relatively short, while at the right side there is no such waste material, since the outer ply of the valve flap is made long.

Fig. 8 is similar to Fig. 7, except that it illustrates the cutting of the intermediate ply 2. In this case, there is a cut-out portion 6 between the two end flaps, while there are additional cut-out portions 7 and 8 to form the stepped edges of the

side flaps. As in Fig. 7, right side, also in Fig. 8, right side, there is no waste material between the end flaps, since in every ply the valve flap is extended as far as possible, i. e., up to the edge of the adjacent end flap. There is shown in Fig. 8 cut-away portions 9 and 10 which might be employed to step the edges of the side flaps as indicated in Fig. 2, but which are not extended below the cross cut in accordance with Fig. 1.

In Fig. 9, there is no cut-away portion between the end flaps, since they are extended in both of the end flaps such as shown in Fig. 1 and that shown in Fig. 2, but there are cut-away portions 11 and 12, broader than cut-away portions 7 and 8, so as to make stepped edges of the inner side flaps for a greater distance than on the intermediate ply. At the right of Fig. 9, likewise, there is no cut-away between the end flaps, these being the same as on the left in this instance. There are the cut-away portions 13 and 14, corresponding to 11 and 12, above the cross cut where a closure in accordance with Fig. 2 is to be formed, but no such cut-away portions to form stepped edges below the cross-cut, where a closure in accordance with that shown at the right of Fig. 1 is to be formed.

It will be readily understood from the above how the positions of the cut lines may be calculated, and how additional portions 4 may be cut out where the fold lines are closer together as indicated in Figs. 3 and 4. Also, it will be readily understood without detailed illustration how the cuts can be formed across the various plies for any construction such as that shown in Figs. 5 and 6 where the ends of the side flaps are cut off flush, but the edges of the side flaps adjacent to the corners are stepped in accordance with this invention.

Figs. 5 and 6 illustrate as already mentioned the application of the invention to a bag, the ends of the side flaps of which are unstepped, i. e. flush with one another.

The ends of such bags can be folded either by pasting in a known way only the inner ply of the side flap to the outer ply of the opposite side flap independent from the special construction of the corners according to the invention, or the individual plies can be interleaved. According to another modification they may be also superposed and interpasted in groups with one another.

From Figs. 5 and 6 it is obvious that the construction of the corners of the bag according to the invention facilitates substantially the manufacture especially of interleaved bags significantly shortening the process by limiting the interleaving only to side flaps without sacrificing in any way the advantages of strength derived from the interleaved construction of the bag end.

This can be practically executed after prefolding the bottom in a known way by providing those parts of the flaps which have to be pasted with glue whereupon the side flaps are folded and pasted alternately over one another ply by ply or in groups of plies. This folding and pasting proceeds in cycles of folding, providing with glue, folding and pasting. These cycles are repeated in accordance with the numbers of plies or groups of plies used for the formation of the bottom.

The invention is obviously not limited to the illustrated types of bags but can be applied to various other modifications without abandoning the main idea of the invention.

We claim:

1. A multi-ply bag with end closure formed by independent side and end flaps adhered together, the side and end flaps on at least one of the corners being stepped in co-ordination with one another and pasted together, step with at least the corresponding step.
2. A multi-ply bag according to claim 1, characterized by a valve flap integrally extended by material won from the stepping of end flaps.
3. A multi-ply bag according to claim 1, the side flaps having their ends stepped also in opposite directions.
4. A multi-ply bag according to claim 1, the ends of the side flaps being also stepped in respect to one another, each step of one side flap being adhered to at least a corresponding step of the opposite side flap.
5. A multi-ply bag according to claim 1, the end flaps being stepped in one direction and the adjacent edges of the side flaps in the opposite one.
6. A multi-ply bag according to claim 1, the flaps having at least two of their plies flush with one another.
7. A multi-ply bag in accordance with claim 1, and having the end flaps folded in together, and the side flaps interfolded.
8. A multi-ply bag according to claim 1, and having the end flaps folded in together and the side flaps interleaved.
9. A multi-ply bag according to claim 1, and having the side flaps interfolded and interpasted.

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KLAS JOHNSON.

CERTIFICATE OF CORRECTION.

Patent No. 2,176,499.

October 17, 1939.

EDGAR HOPPE, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, lines 16, 17 and 18, for the words "end flaps the edges of which in one direction and side flaps stepped adjacent to the respective corner" read "end flaps stepped in one direction and side flaps the edges of which adjacent to the respective corner; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of December, A. D. 1939.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.

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2. A multi-ply bag according to claim 1, characterized by a valve flap integrally extended by material won from the stepping of end flaps.
3. A multi-ply bag according to claim 1, the side flaps having their ends stepped also in opposite directions.
4. A multi-ply bag according to claim 1, the ends of the side flaps being also stepped in respect to one another, each step of one side flap being adhered to at least a corresponding step of the opposite side flap.
5. A multi-ply bag according to claim 1, the end flaps being stepped in one direction and the adjacent edges of the side flaps in the opposite one.
6. A multi-ply bag according to claim 1, the flaps having at least two of their plies flush with one another.
7. A multi-ply bag in accordance with claim 1, and having the end flaps folded in together, and the side flaps interfolded.
8. A multi-ply bag according to claim 1, and having the end flaps folded in together and the side flaps interleaved.
9. A multi-ply bag according to claim 1, and having the side flaps interfolded and interpasted.

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