April 24, 1934. P. H. HENKEL 1,956,287

BAG AND METHOD OF FORMING SAME

Filed July 26, 1932 2 Sheets-Sheet 1

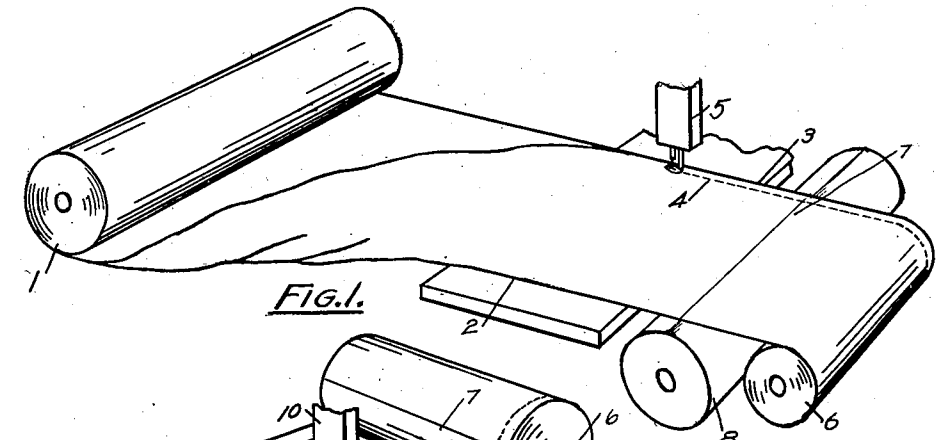



FIG. 1.

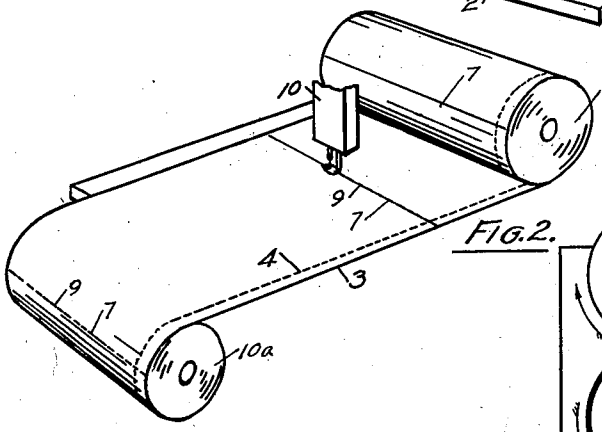



FIG. 2.

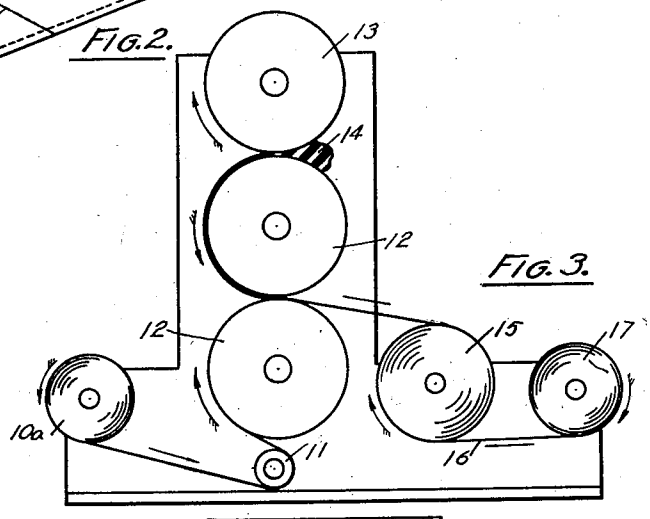



FIG. 3.

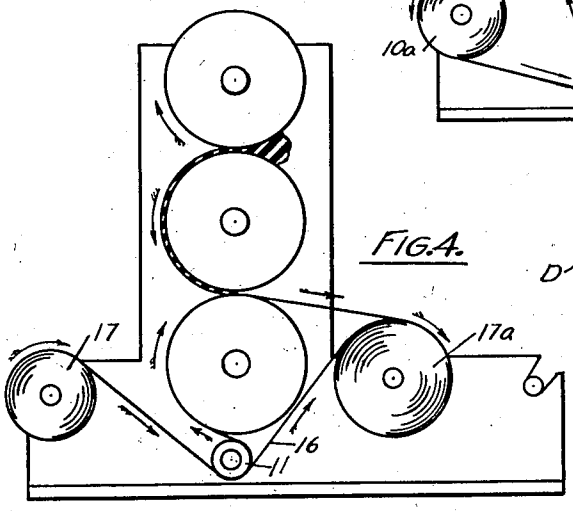



FIG. 4.

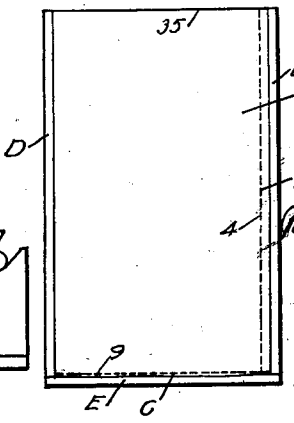



FIG. 4a.

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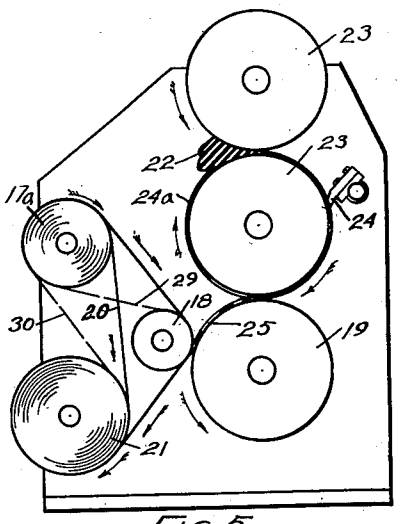



FIG. 5.

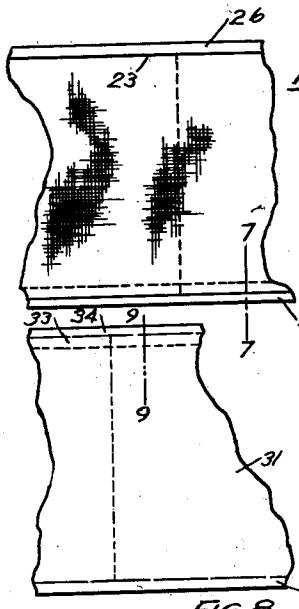



FIG. 6.

FIG. 8

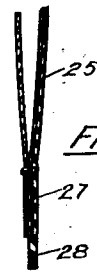



FIG. 7.

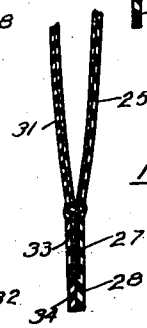



FIG. 9.

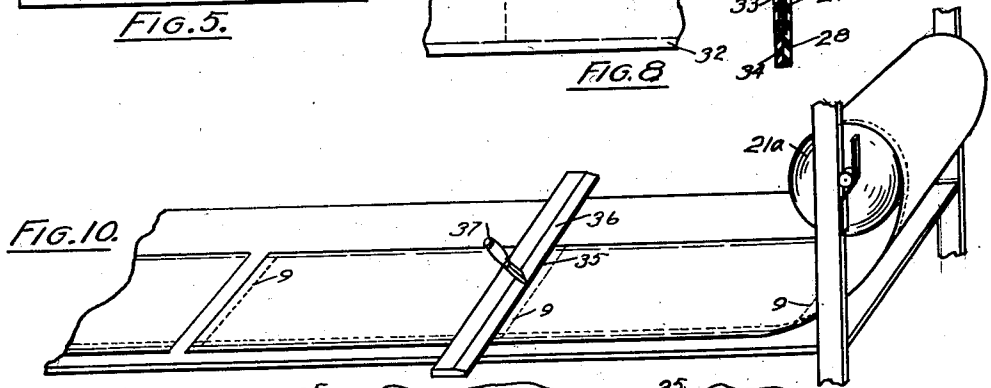



FIG. 10.

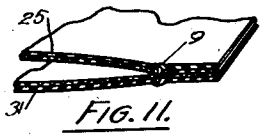



FIG. 11.

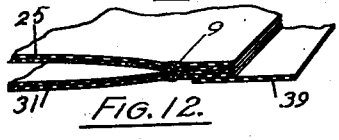



FIG. 12.

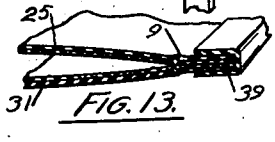



FIG. 13.

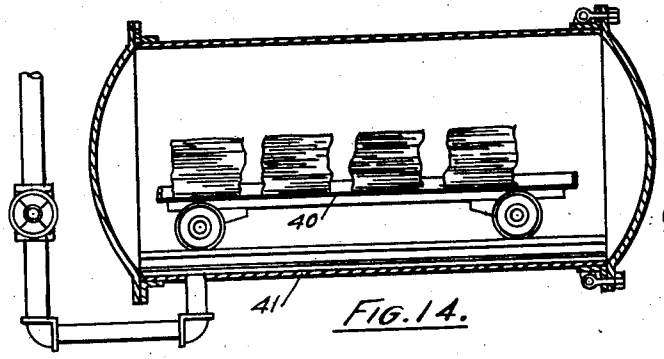



FIG. 14.

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# UNITED STATES PATENT OFFICE

1,956,287

## BAG AND METHOD OF FORMING SAME

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Application July 26, 1932, Serial No. 624,764

35 Claims. (Cl. 154—2)

For very many purposes it is desirable to use canvas in the formation of bags and when subjected to a great many uses it is desirable to make such bags impervious. This is particularly true where the bags are used for fine powders. The present invention is designed to form canvas bags in a very cheap and simple manner and to render such bags impervious, preferably by filling the mesh of the bags with a filler, such as rubber, and where the parts of the canvas are secured by seams, which is a preferable manner of securing the parts together, to fill not only the interstices of the canvas itsel, but also the openings formed by the seams. The method also contemplates a coating of the fabric so treated with a thin layer of rubber and of re-enforcing the bottom edges of the bags. In carrying out the invention the preferable method is to form the canvas in extended lengths and treat the canvas and apply the rubber in this elongated form. This is very advantageous because it permits of calendering the canvas and applying the rubber through a calendering operation. Features and details of the method will appear from the specification and claims.

A preferred manner of practicing the invention is illustrated in the accompanying drawings as follows:—

Fig. 1 is a perspective view showing the seaming operation along one edge of the fabric and the marking of the fabric for cross sewing.

Fig. 2 shows a perspective view of the manner of cross seaming the folded and edge seam fabric at intervals.

Fig. 3 is a side elevation illustrating the calendering of the material on one side of the seamed fabric.

Fig. 4 a similar view showing the calendering of the opposite wall of the fabric.

Fig. 4*a* an elevation showing the completed bag.

Fig. 5 an end view illustrating the calendering operation applying the thin rubber layer to the walls of the bag.

Fig. 6 shows an elevation of a fragment of the fabric having the layer of rubber applied to one side.

Fig. 7 shows a section on the line 7—7 in Fig. 1.

Fig. 8 an elevation showing the rubber applied to the reverse side of the bag forming strip.

Fig. 9 a section on the line 9—9 in Fig. 8.

Fig. 10 a perspective view illustrating the manner of separating the bag units from the bag forming strip.

Fig. 11 is a perspective sectional view showing the formation of the bottom of the bag after it is severed from the strip.

Fig. 12 a view showing the application of a sealing strip over the bottom.

Fig. 13 a similar view with the application of the sealing strip completed.

Fig. 14 a sectional view showing the manner of vulcanizing the fabricated bags.

The canvas comes in a roll 1. It is folded at 2. The free edges 3 are secured by a stitched seam 4 which is formed by a sewing machine through which the strip of canvas is fed. The canvas is marked crosswise at 7, the intervals corresponding to the length of a bag. This marking may be done in any preferred manner in the fabricating of the cloth, or by a printing operation. As shown it is accomplished by a printing roll 8 which makes a cross mark with each revolution and has a travel giving the proper length to the bag. The strip is formed into a roll 6 and it is fed from this roll and closed at intervals by cross seams 9, the marking 7 indicating the location of the cross seams. This stitching is done by an ordinary sewing machine, the canvas being fed off the roll 6 and formed into a roll 10*a*.

The canvas so united along the edges and crosswise is then calendered. The strip so seamed is fed off the roll 10*a* around a guide roll 11 and through calendering rolls 12. An upper calender roll 13 is also provided and the rubber mass 14 arranged in the bite between the upper roll and the intervening roll and the rubber is carried around the intermediate roll and applied to the canvas strip under very heavy pressure which forces the rubber into the interstices of the canvas and into the small openings formed by the stitching. The amount of rubber so forced into the canvas is nicely regulated by the spacing of the calender rolls controlling the film of rubber by means of which this calendering operation is accomplished. This control can be so handled that the canvas on the inside of the strip as formed will be fairly clear of rubber. It will be noted that in this operation two layers of canvas are, of necessity, passed through the calender. This is an unusual calendering operation, but experience indicates that it is entirely feasible. The canvas is then rolled on a roll 15 and as it is rolled an insulating cloth 16 is fed in between the several rolls, the cloth 16 being fed from a roll 17. A similar calendering operation is applied to the opposite side of the canvas. The canvas is fed from the roll 17 around the guide roll 11. The insulating cloth is separated from the fabric at the guide roll and

the strip of fabric is carried between the calender rolls 12 and receives the mass of rubber in the same manner as the preceding side of the strip, as illustrated in Fig. 3. The only difference is that the insulating cloth is separated at the roll 11 from the bag strip and is again formed in insulating position in the roll 17*a*. At the conclusion of this calendering operation there is a canvas bag fabricated with stitched seams in which the interstices of the canvas itself are thoroughly filled through a calendering operation and the openings formed by the stitches are completely filled and rendered impervious by the same operation. It is, however, often desirable to extend the treatment of the canvas by applying to the calendered stock a thin layer of rubber and this is accomplished with the following steps. The calendered fabric is fed from the roll 17*a* between a squeeze roll 18 and a calendering roll 19. An insulating cloth 20 is carried around the roll 18 and is wound with the rubber-coated fabric on a roll 21. Upper calender rolls 23—23 receive the rubber in the usual manner between the upper rolls at 22 and the rubber is trimmed by cutters 24 in the usual manner of calenders, the surplus of rubber 24*a* being returned to the mass and the part between the cutters passing down between the squeeze roll 18 and the calendering roll 19 where it is intimately united with the calendered surface of the fabric. At the completion of this operation I have the fabricated strip with a thin coat of rubber 25, this at the folded edge 23 extending at 26 beyond this folded edge and at the seamed edge extending over the portion of the canvas outside of the seam by a layer 27 which is extended by a strip 28 outside of the edge of the canvas. After this calendering operation the strip is again placed in the calender and the roll 21 substituted for the roll 17*a* and the fabric is fed off the roll on the lines 29 and the insulating cloth along the line 30. Again a coat of rubber 31 is placed on the fabric strip on the opposite side of the fabric strip and this rubber has an extended edge 32 which through the calender action is united with and forced into close contact with the extended edge 26. Likewise the rubber is extended at 33 over the part of the canvas outside of the seam and has a strip 34 outside of the edge of the canvas, this strip being intimately united with the corresponding strip on the other side. The roll 21*a* which is made after putting on the second layer is then mounted over a table and as the material is drawn out the strip is cut into bag units on the line 35 which is just slightly off-set from the bottom seam 9. This cutting may be accomplished in any convenient manner. As shown a straight edge 36 is used and a knife 37 drawn through the strip. At the completion of this operation the closed end at the bottom of the bag has a seam with the overlapping portions of fabric below the seam and overlapping portions of rubber below the seam, th exposed edge at this point being the cut edge as the unit was severed. Preferably a sealing strip 39 is secured to one face below the seam and folded over the bottom and united with the opposite face.

The bags thus fabricated are properly insulated, or dusted. If desired, a plate may be inserted into the bag between the layers, or the layers thoroughly dusted and the bags properly insulated are piled on to a vulcanizer car and run into a vulcanizer and vulcanized.

The bag formed is shown in Fig. 4*a* wherein it will be seen that the finished bag A has a side seam B and a bottom seam C, these seams being entirely filled as well as the canvas in the calendering operation. The bag is further sealed by the extending edges D of the rubber and by the overlapping fold E at the bottom of the bag. In some uses it may be desirable to place the canvas on the outside of the bag and where this is done the bag is simply reversed, thus placing the rubber and seam flaps on the inside of the bag.

While I have specifically described and disclosed and preferred the method of applying the rubber to the canvas and the forcing of the rubber into the interstices of the canvas and the seam openings by a calendering operation in that the high pressure of such an operation more thoroughly accomplishes this result and the control of the flow of the material to the opposite surface can be regulated, perhaps, with more certainty, I do not wish to be limited in the broader phases of the invention to this particular method of filling the interstices of the rubber and seam openings

What I claim as new is:—

1. The method of forming bags which consists in fabricating walls of canvas into bag form, applying a rubber filler, extending the same into the interstices of the walls while restricting the filler substantially to one surface of the canvas, and vulcanizing the bag so formed.

2. The method of forming bags which consists in fabricating walls of canvas into bag form with a stitched seam uniting the walls, treating the bag so stitched with a filler extending into the interstices of the bag and the stitch openings, and restricting the filler to substantially one surface of the bag.

3. The method of forming bags which consists in fabricating walls of canvas into bag form with a stitched seam uniting the walls, treating the bag so stitched with a filler of rubber extending into the interstices of the bag and the stitch openings, restricting the filler to substantially one surface of the bag, and vulcanizing the bag so formed.

4. The method of forming bags which consists in fabricating walls of canvas into bag form, applying a filler of rubber into the interstices of the canvas bag while restricting the filler to substantially one surface of the bag, applying a thin layer of rubber to the canvas so filled, and vulcanizing the completed fabric.

5. The method of forming bags which consists in fabricating walls of canvas into bag form with a stitched seam uniting the walls, applying a filler of rubber to the interstices and stitch openings of the seams while restricting the filler to substantially one surface of the walls, applying a thin layer of rubber to the filled canvas, and vulcanizing the same.

6. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas, applying a filler to the canvas and extending the same into the interstices thereof while restricting the filler to substantially one surface of the bag, and severing the strip into bag units.

7. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas together and securing the layers of canvas crosswise at intervals corresponding to the length of a bag, applying a filler extending into the interstices of the canvas and restricted substantially to one surface of the canvas, and severing the strip into bag units.

8. The method of forming bags which consists in doubling lengthwise canvas of a length of a

plurality of bags, securing the edges of the canvas together by seams, securing the layers together crosswise at intervals by seams, applying a rubber filler, extending the same into interstices of the walls while restricting the filler substantially to one surface of the canvas, severing the canvas adjacent to the cross seams, and vulcanizing the bags so formed.

9. The method of forming bags which consists in fabricating walls of canvas into bag form and calendering a filler into the interstice of the canvas walls so formed.

10. The method of forming bags which consists in fabricating walls of canvas into bag form and calendering a filler of rubber into the interstices of the canvas walls so formed.

11. The method of forming bags which consists in fabricating walls of canvas into bag form with a stitched seam uniting the walls and calendering a filler into the interstices of the canvas and the stitch openings formed by the seams.

12. The method of forming bags which consists in fabricating walls of canvas into bag form with a stitched seam uniting the walls and calendering a rubber filler into the interstices of the canvas and the stitch openings formed by the seams.

13. The method of forming bags which consists in fabricating walls of canvas into bag form with a seam along at least one edge of the bag and the bottom of the bag, and calendering a filler into the interstices of the canvas and the stitch openings formed by the seams.

14. The method of forming bags which consists in fabricating walls of canvas into bag form, calendering a filler into the interstices of the canvas walls, applying a thin layer of rubber to the calendered canvas, and vulcanizing the completed fabric.

15. The method of forming bags which consists in fabricating walls of canvas into bag form, calendering a filler into the interstices of the canvas walls, applying a thin layer of rubber by calendering, and vulcanizing the completed fabric.

16. The method of forming bags which consists in fabricating walls of canvas into bag form with a stitched seam uniting the walls, calendering a filler into the interstices of the canvas and the stitch openings formed by the seams, applying a thin layer of rubber to the calendered canvas, and vulcanizing the same.

17. The method of forming bags which consists in fabricating walls of canvas into bag form, calendering a filler into the interstices of the canvas walls so formed, applying a thin layer of rubber to the calendered canvas with the rubber of one side extending beyond the edge of the canvas and united with the rubber of the opposite side, and vulcanizing the fabric so formed.

18. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags and securing the edges of the canvas, calendering a filler into the interstices of the canvas, and severing the strip into bag units.

19. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas together and securing the layers of canvas together crosswise at intervals corresponding to the length of a bag, and calendering a filler into the interstices of the canvas, and severing the strip into bag units.

20. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas by a stitched seam, calendering a filler into the interstices of the canvas of the strip and the stitch openings formed by the stitches, and severing the strip into bag units.

21. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the layers of canvas together crosswise at intervals corresponding to the length of the bag by seams, calendering a filler into the canvas interstices and seams, and severing the strip into bag units.

22. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags and securing the edges of the canvas, calendering a filler into the interstices of the canvas, applying layers of rubber to the calendered fabric, and severing the strip into bag units.

23. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas together and securing the layers of canvas together crosswise at intervals corresponding to the length of a bag, calendering a filler into the interstices of the canvas, applying layers of rubber to the calendered fabric, and severing the strip into bag units.

24. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas, calendering a filler into the interstices of the canvas, applying layers of rubber to the calendered fabric with the rubber extending beyond the edges of the canvas, and severing the strip into bag units.

25. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas, calendering a filler into the interstices of the canvas, severing the strip into bag units, and folding a sealing strip comprising rubber over the bottom of each severed unit.

26. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas together and securing the layers of canvas together crosswise at intervals corresponding to the length of a bag, calendering a filler into the interstices of the canvas, severing the strip into bag units, and folding a sealing strip comprising rubber over the bottom of each severed unit.

27. The method of forming bags which consists in doubling lengthwise canvas of a length of a plurality of bags, securing the edges of the canvas together and the layers of canvas together crosswise at intervals by stitching, calendering a filler into the interstices of the canvas and the stitch openings formed by the stitches, applying a layer of rubber over the calendered fabric, severing the strip into bag units, and folding a sealing strip over the bottom edge of the severed units.

28. A bag having walls of canvas having some of the edges of the walls at least united by a stitched seam, said canvas and seam being sealed by rubber calendered into the fabric and seam.

29. A bag having walls of canvas, said walls being united along the bottom by a stitched seam, said canvas and seam being sealed by rubber calendered into the fabric and seam.

30. A bag having walls of canvas with the walls united along one edge and along the bottom by

stitched seams, said canvas and seams being sealed by rubber calendered into the fabric and seam.

31. A bag having walls of canvas having some of the edges of the walls at least united by a stitched seam, said canvas and seam being rubber calendered and having a thin layer of rubber vulcanized to the rubber calendered canvas, said rubber layer on each wall extending beyond the canvas and united with the rubber layer of the opposite wall of the bag.

32. A bag having walls of canvas with the walls united along one edge and along the bottom by stitched seams, said canvas and seams being rubber calendered and having a thin layer of rubber vulcanized to the rubber calendered canvas, said rubber layer on each wall extending beyond the canvas and united with the rubber layer of the opposite wall of the bag.

33. A bag having canvas walls united along one edge and the bottom by a stitched seam, the canvas and the seams being rubber calendered, rubber layers extending over each wall of the canvas and beyond the edges of the canvas and united on the said edges, and a strip comprising rubber folded over the bottom.

34. A bag having its walls formed of canvas, some of the edges of the walls being united by a stitched seam, said walls being sealed by rubber in the interstices of the canvas and the openings of the seam, said rubber extending from one side of the canvas.

35. A bag having its walls formed of canvas and some of the edges of the walls united by a stitched seam, said walls being sealed by rubber in the interstices of the canvas and the openings of the seam, said rubber being substantially restricted to one surface of the canvas.

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