

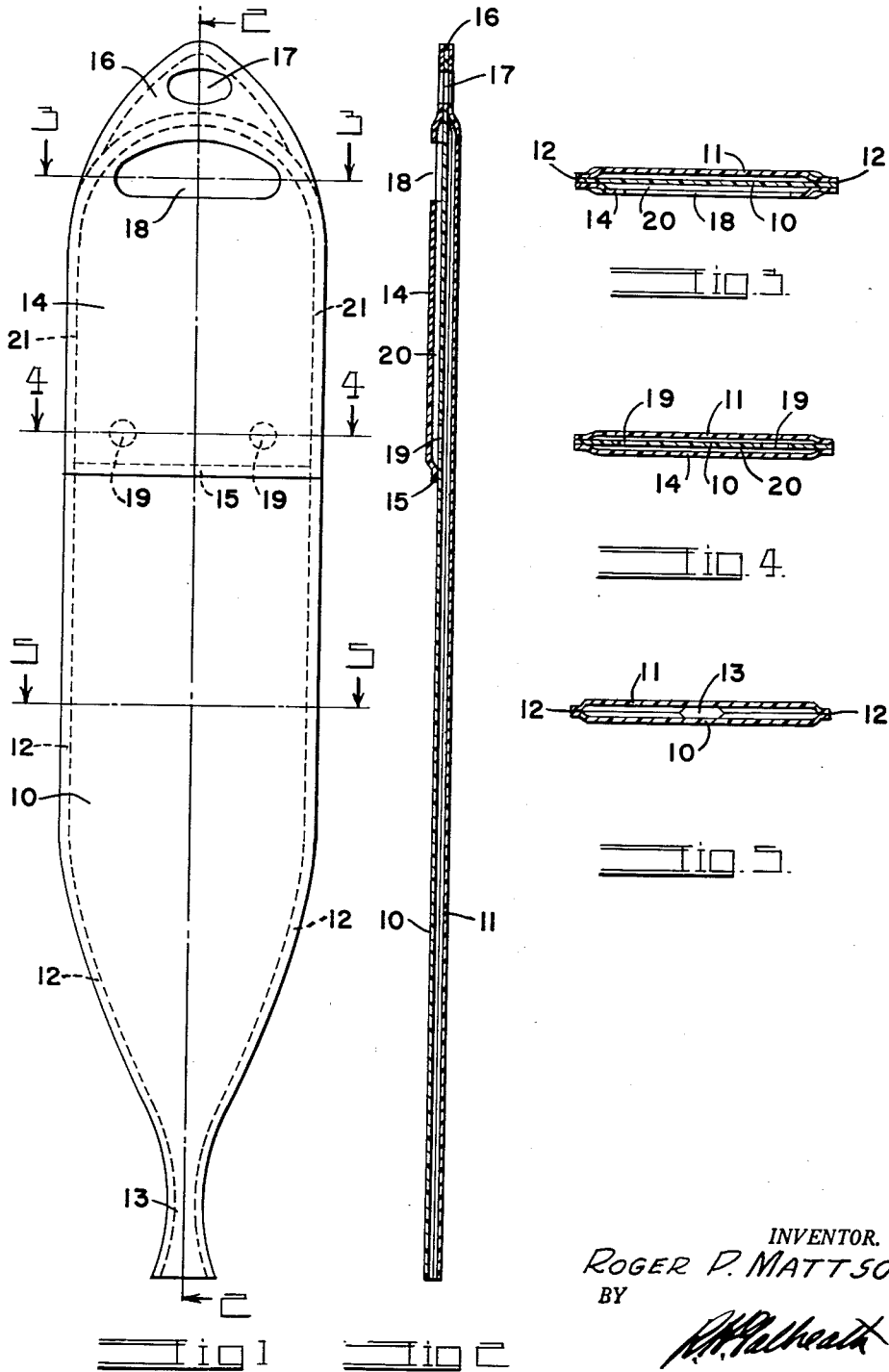
Oct. 10, 1961

R. P. MATTSON
MATERIAL MIXING BAGS

3,003,682

Filed May 1, 1959

3 Sheets-Sheet 1



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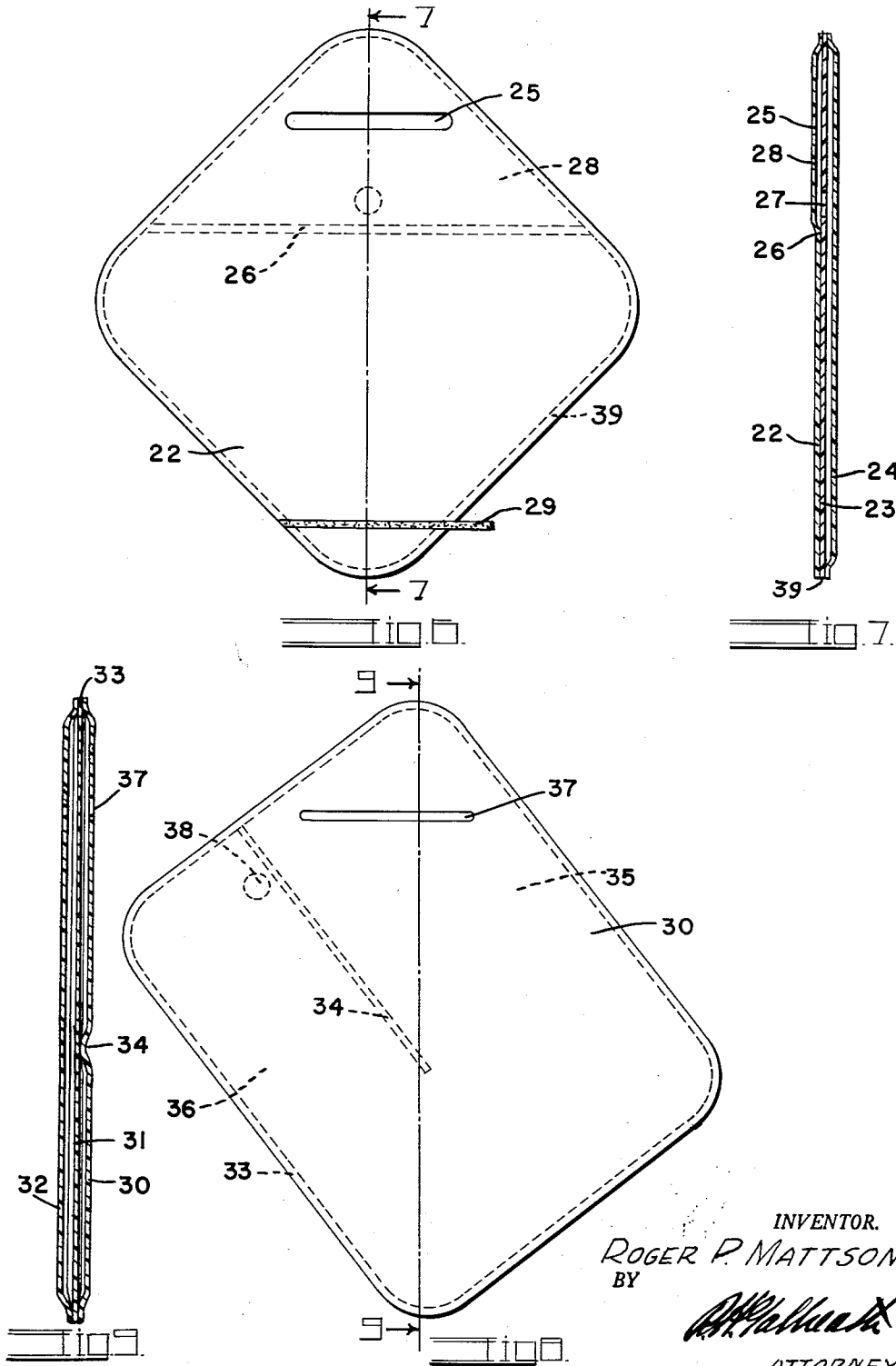
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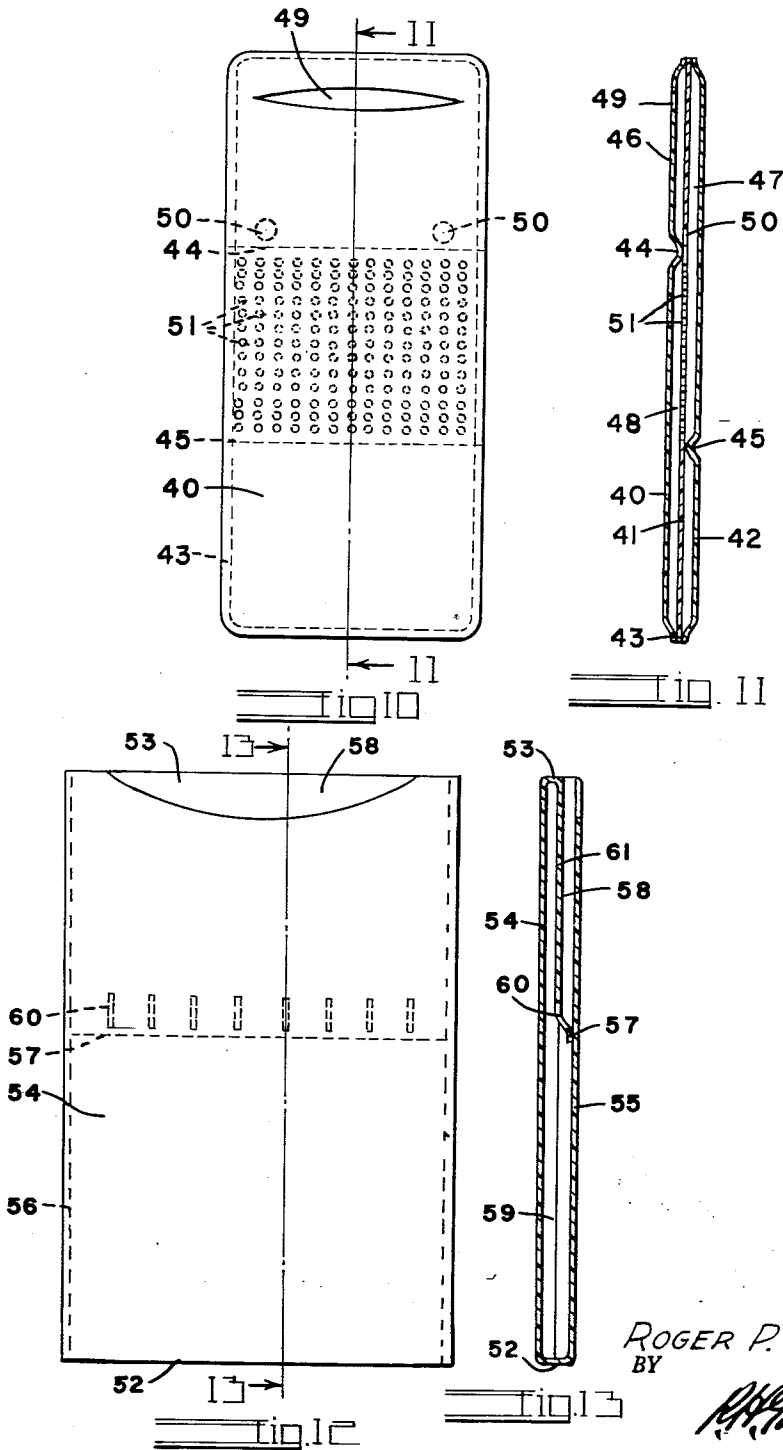
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3 Sheets-Sheet 3



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MATERIAL MIXING BAGS

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This invention relates to a flexible self sealing bag in which materials, preferably dry materials, of various types may be packed and merchandised and to which water or other liquid may be added and the bag manipulated to intermix the liquid and the original materials into a homogeneous mixture for use.

The principal object of the invention is to provide a highly efficient bag for the above purposes which will have integrally included valving means for retaining the original material in the bag in a sanitary "untouched" condition and yet which will allow the fluid to be quickly and easily placed in the bag for intermixture by manipulation.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawings which forms a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:

FIG. 1 is a side view of a first form of the improved bag;

FIG. 2 is a vertical longitudinal section therethrough taken on the line 2—2, FIG. 1;

FIGS. 3, 4 and 5 are cross sections therethrough taken on the lines 3—3, 4—4, and 5—5, FIG. 1 respectively;

FIG. 6 is a second form of the improved bag;

FIG. 7 is a longitudinal section through the second form taken on the line 7—7, FIG. 6;

FIG. 8 is a third form of the improved bag;

FIG. 9 is a longitudinal section through the third form taken on the line 9—9, FIG. 8.

FIG. 10 is a side view of a fourth form of the bag;

FIG. 11 is a vertical section through the form of FIG. 10, taken on the line 11—11, FIG. 10;

FIG. 12 is a side view of a fifth form of the bag; and

FIG. 13 is a vertical section through the form of FIG. 12, taken on the line 13—13, FIG. 12.

The invention is designed for any use where a powdered, granular or flocculant dry material is to be packaged for delivery to the user for intermixture with water or other fluid before use. One such use is as an enema bag containing the proper amount of barium meal to which water can be quickly and easily added for immediate use in preparing a patient for an X-ray exploration. It is also applicable as a closed container for various substances, as a mixing bag for intermixing solid materials with liquid materials, such as dehydrated foods with water and as a cooking bag for intermixing and cooking an intermixture of edible materials. For ordinary uses, the bag is formed from exceedingly thin, preferably transparent, sheets of waterproof polyethylene plastic. However, for use as a cooking bag and for similar uses, special types of plastic such as "Mylar" and "Scotch Pak" sheets may be used.

The first form of the improved bag, as shown in FIGS. 1-5, comprises an intermediate sheet 10 sealed or thermo-welded around its peripheral edges to a similar back sheet 11 as indicated at 12. For enema purposes, the bag terminates at its bottom in a relatively narrow discharge neck 13 which can be readily slipped over and clamped to conventional enema equipment. A pocket

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flap forming a front sheet 14 is sealed over the upper portion of the outer face of the intermediate sheet 10 by means of a transverse thermo-weld 15 and an edge weld 21 to form a fluid pocket 20.

The upper extremities of the three sheets 10, 11 and 14 are overlapped and sealed together to form a triple-thickness hanging tab 16 having a suitable hanging opening 17 to enable the bag to be readily hung from any suitable support. A fluid receiving opening or mouth 18 is formed through the pocket flap 14 adjacent the upper extremity of the latter and flutter valve ports 19 are formed through the intermediate sheet 10 so as to communicate between the lower portion of the pocket 20 and the interior of the bag between the intermediate sheet 10 and the back sheet 11.

For the purpose of illustration, the sheets 10, 11 and 14 have been shown in slightly separated relation in FIG. 2. Actually, when the bag is empty, these sheets lie against and in contact with each other over their entire surfaces but are free to separate except where sealed together at 12, 15, 16 and 21.

When furnished to the user, the discharge neck 13 is sealed by tying, clamping or any suitable manner and the space between the intermediate and back sheets 10 and 11 are filled with the material to which water or other fluid is to be later added to form a desired solution. As the bag is filled, it expands and pushes the intermediate sheet 10 outwardly and tightly against the front sheet or pocket flap 14 so that the latter acts as a valve to completely seal the ports 19.

When desired for use, water or other liquid is introduced through the mouth 18 into the pocket 20. The weight of the liquid forces the pocket flap 14 outwardly and away from the front sheet 10 and away from the ports 19 to allow free entry of the liquid into the bag. The bag can then be manipulated in the hand to thoroughly intermix and bring the material into solution.

For enema use, the neck 13 is connected to the enema equipment and the bag is suspended by the hanging opening 17. If the bag is to be used for simple, intermixing purposes, the neck 13 can be sealed after packing and the fluid can be added and the bag manipulated from intermixture when desired for use. The neck 13 can then be cut away to allow the material to be extruded by pressure upon the bag.

The second form of the bag, illustrated in FIG. 6, embodies all of the principles of construction of the first form and is designed more particularly as a simple marketing container and mixing bag or pouch for any material to which water or other liquid is to be added for use. The second form comprises a front sheet 22, an intermediate sheet 23 and a back sheet 24 of similar size and shape, preferably but not necessarily, of a rectangular conformation with rounded corners. The three sheets are thermo-sealed together around their peripheral edges as indicated at 39. The front sheet 22 is provided with a liquid introduction slot 25 extending diagonally of and adjacent one of the rounded corners and the latter sheet is sealed to the intermediate sheet 23 by means of a diagonal seal 26 extending substantially parallel to the slot 25 so as to form a liquid pocket 28 at one of the corners of the bag. A valve port 27 is formed in the intermediate sheet 23 communicating between the pocket 28 and the interior of the bag adjacent the diagonal seal 26.

The function and use of the second form is similar to the first form, that is, the bag is furnished to the user with the dry material contained therein between the intermediate sheet 23 and the back sheet 24. The expansion of the two sheets tightly seals the valve port 27 against the front sheet 22. When desired for use, the user simply pulls the lower edge of the liquid slot 25 forwardly to

form a receiving funnel and pours liquid into the pocket 28. The liquid will force the front sheet away from the port 27 to allow the liquid to freely flow to the material in the bag. When the required amount of liquid has been introduced, the bag is simply manipulated in the hands to thoroughly intermix the liquid and the dry material, after which, a corner of the bag can be cut away to discharge the material for use. For convenience in opening a corner of the bag, a tear strip 29 may be imbedded in the material of the front sheet similarly to the tear strips employed on cigarette packages.

The third form of the device as shown in FIGS. 8 and 9 has all of the essential features of the two previously described forms and is very similar to the form of FIG. 6 in that it comprises three flexible sheets similar in size and shape and comprising a front sheet 30, an intermediate sheet 31, and a back sheet 32 all sealed together around their peripheral edges by means of a thermoseal 33. The front sheet 30 is also thermo-sealed by means of a partition seal 34 to the intermediate sheet 31. The partition seal 34 extends from one extremity of the bag parallel with and spaced from the two sides thereof and terminates in spaced relation to the other extremity of the bag to form what might be termed a "down" pocket 35 adjacent one side of the bag and an "up" pocket 36 adjacent the other side of the bag.

The two pockets 35 and 36 communicate with each other around the lower extremity of the partition seal 34. The front sheet 30 is formed with a fluid entrance slot 37 adjacent the top of the "down" pocket 35 and an intake valve port 38 is formed in the intermediate sheet 31 adjacent the top of the "up" pocket 36 so as to communicate between the latter and the space between the intermediate sheet 31 and the back sheet 32. Fluid introduced through the entrance slot 37 will flow down the "down" pocket 35 and fill the lower portion of the space between the front sheet 30 and the intermediate sheet 31. If the entire bag be now rotated, this fluid will flow into the "up" pocket 36 and through the port 38 into the material prepacked between the intermediate sheet 31 and the back sheet 32.

The third form of the invention provides a more complete seal for the port conveying the fluid to the material compartment and also provides a more complete seal to prevent the escape of material from the material compartment due to the tortuous path between the entrance slot 37 and the port 38.

The fourth form of the bag, shown in FIGS. 10 and 11, has the same objects and advantages as the previously described forms and is more particularly designed for a large capacity use. It is formed from three similar sheets of material comprising a front sheet 40, an intermediate sheet 41, and a back sheet 42 sealed together about their peripheral edges, as indicated at 43. The front sheet 40 is sealed to the intermediate sheet 41 by means of an upper transverse partition seal 44 and the back sheet 42 is sealed to the intermediate sheet 41 by means of a lower transverse partition seal 45 to form a fluid receiving funnel 46, a fluid receiving chamber 47, and a material containing pocket 48 of substantially equal capacity. The funnel 46 is provided with an intake slot 49 and communicates with the fluid receiving chamber 47 through valved ports 50. The chamber 47 communicates with the pocket 48 through a plurality of perforations 51 which permit the

fluid and material to be refluxed back and forth between the chamber 47 and the pocket 48 to break up any lumps in the mixture during the kneading step. The inner face of the front sheet 40 serves as a flutter valve over the ports 50.

The fifth form, shown in FIGS. 12 and 13 is very similar in general structure to the first form of FIGS. 1 and 2. It is, however, formed from a single continuous sheet of material upwardly along a bottom fold 52 and downwardly along a top fold 53 to form a front portion 54, a back portion 55 and an intermediate extremity 51. The folded portions are sealed along their side edges, as shown at 56 and the intermediate extremity 61 is sealed to the back portion 55 along a transverse seal 57 to form a water receiving funnel 58 and a material pocket 59 communicating with each through slotted ports 60. The fifth form functions similarly to the first form.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied within the scope of the appended claims, without departing from the spirit of the invention. Having thus described the invention what is claimed and desired secured by Letters Patent is:

1. A bag for intermixing a liquid with a material comprising: a front sheet; a pocket sheet; a back sheet, said sheets being of flexible material sealed together to form a material pocket between the front sheet and the back sheet; and a liquid pocket between the front sheet and the pocket sheet, therebeing a liquid entrance opening communicating through the pocket sheet with the upper portion of the liquid pocket and a valve port communicating between the liquid pocket and the material pocket, said pocket sheet overlying said valve port to provide a closure for the latter until liquid is introduced into said liquid pocket, said three sheets extending upwardly in sealed contacting relation to form a hanging tab having a hanging opening formed therein so as to maintain said bag in a vertical position.

2. A bag for intermixing a liquid with a material comprising: a vertically elongated front sheet; a vertically elongated back sheet, said sheets being sealed together around their peripheral edges to form a material pocket therebetween; and a pocket sheet covering the upper portion of the front face of said front sheet and forming a liquid pocket on the upper portion of said front sheet, therebeing a relatively large opening for introducing fluid into the upper portion of said liquid pocket and a relatively small port communicating through the front sheet adjacent the bottom of said liquid pocket and the material pocket, said back sheet, said front sheet and said pocket sheet all extending upwardly above said liquid and material pockets, the extending above portions of all sheets being secured together to form a reinforced hanging tab provided with a hanging opening.

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