April 28, 1936. A. ERLANGER 2,038,993

METHOD AND APPARATUS FOR REMOVING WATER FROM CLOTHES

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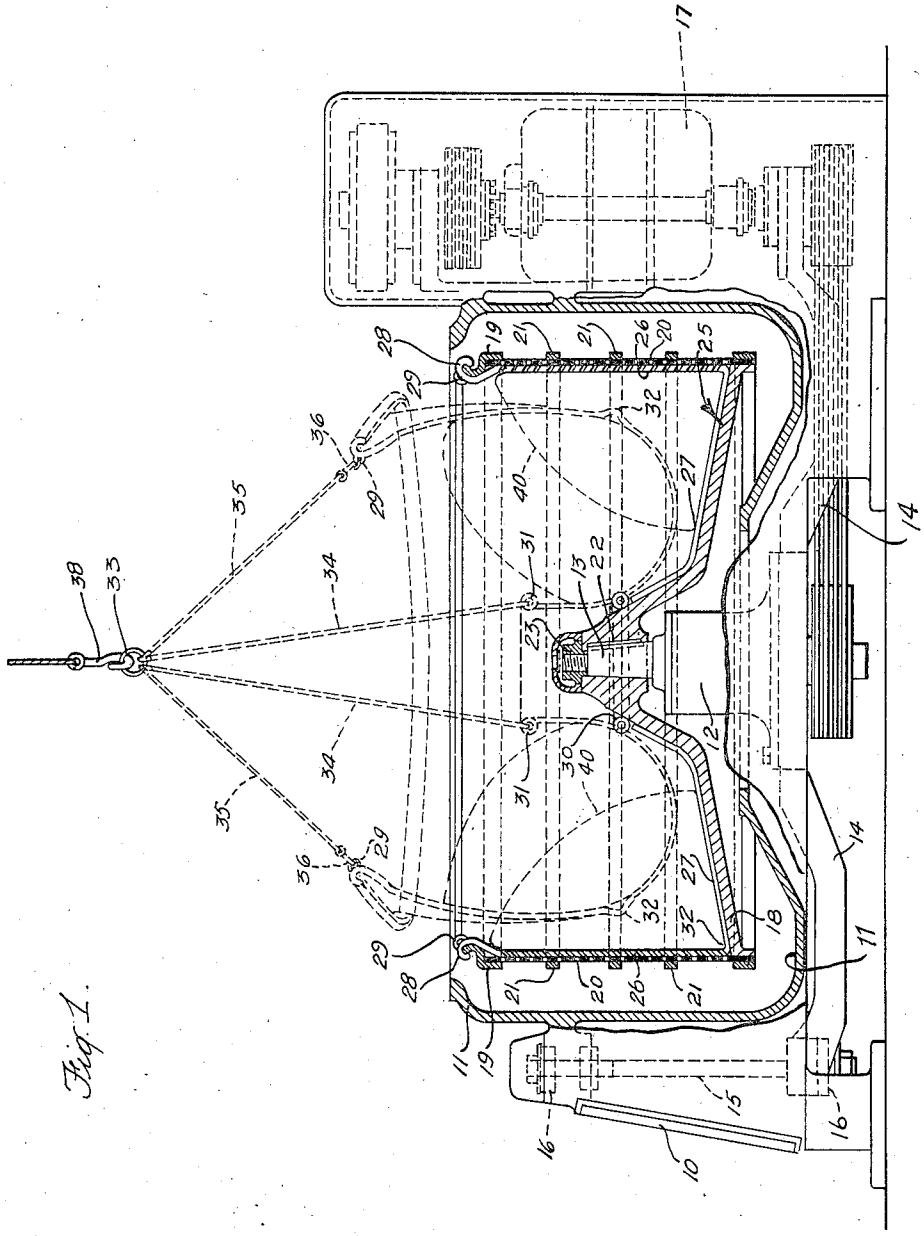


Fig. 1.

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Fig. 2.

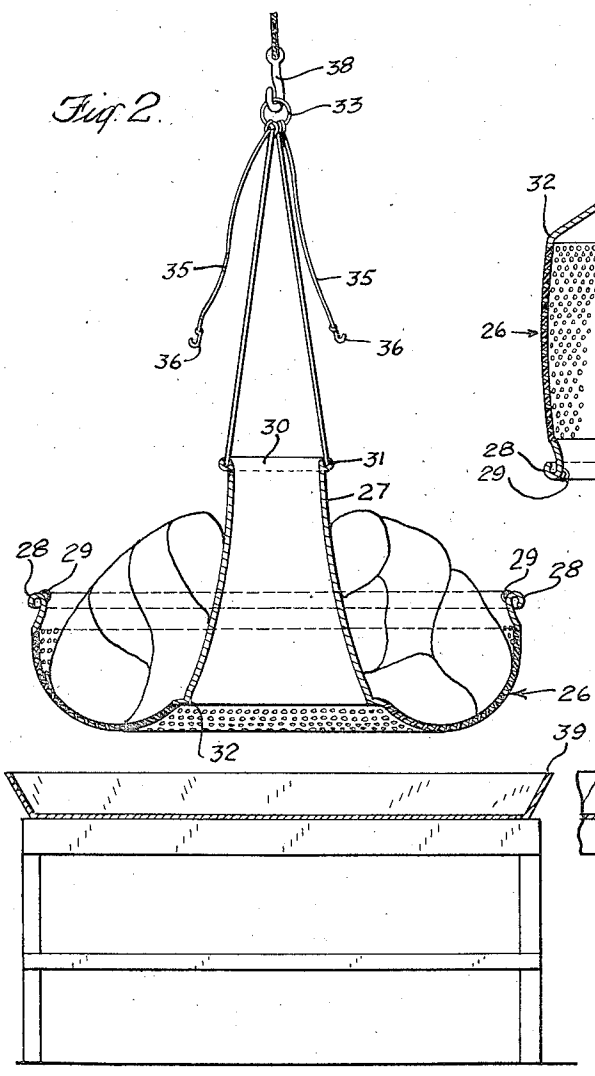
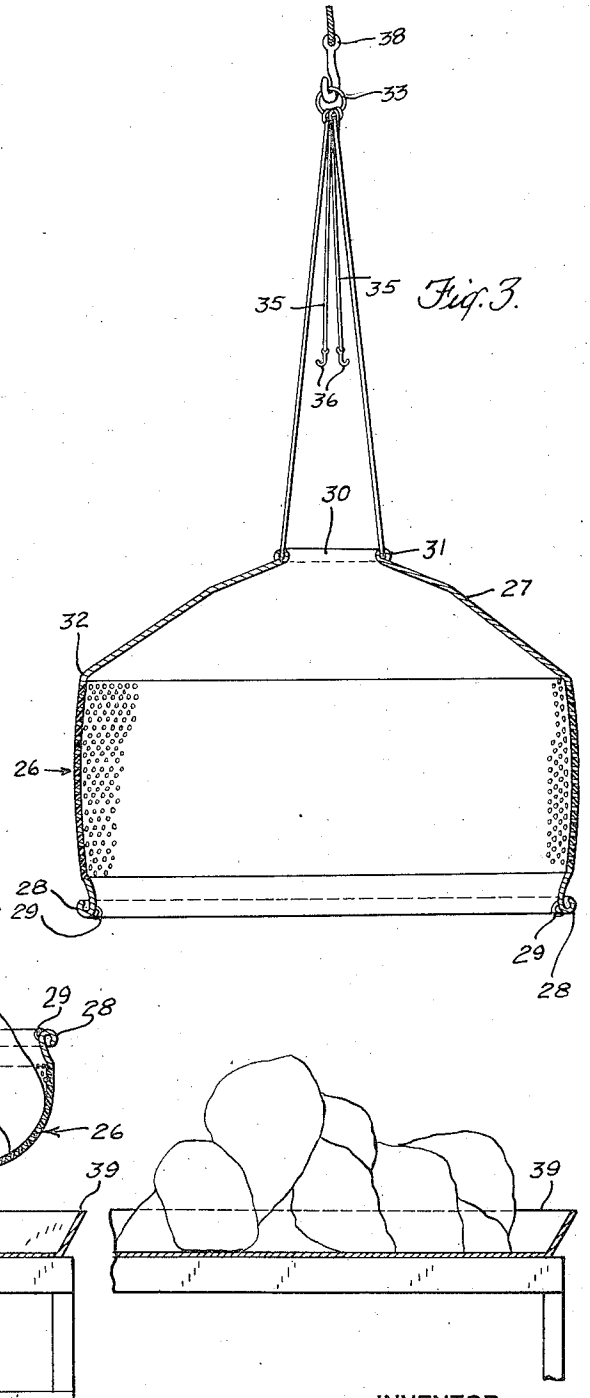


Fig. 3.



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Fig. 4.

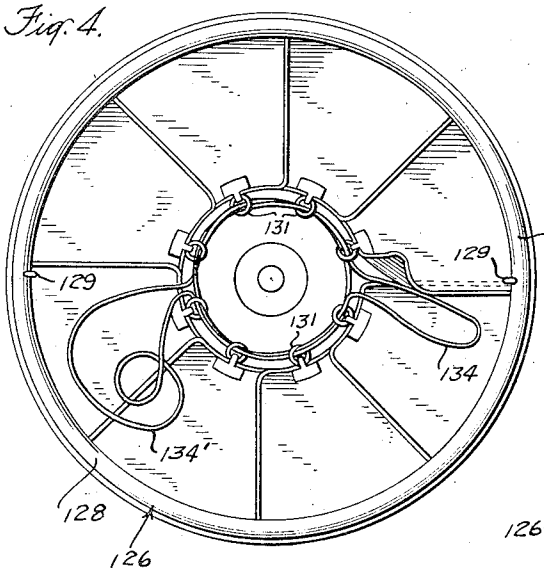


Fig. 6.

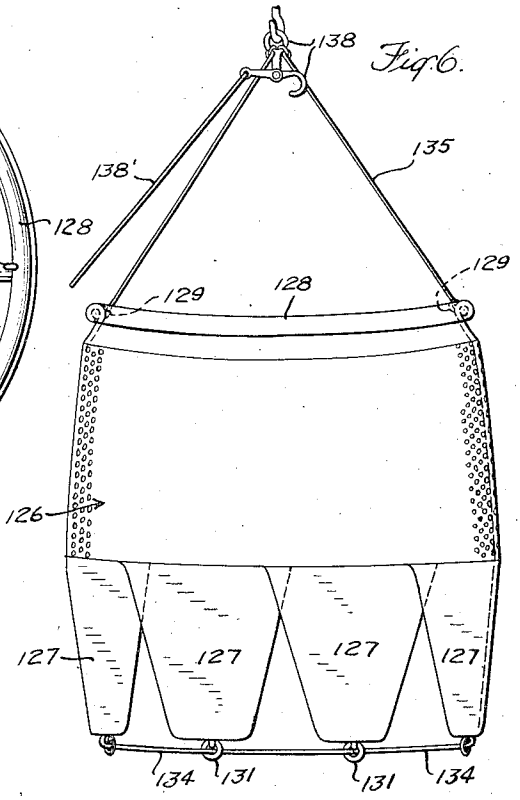
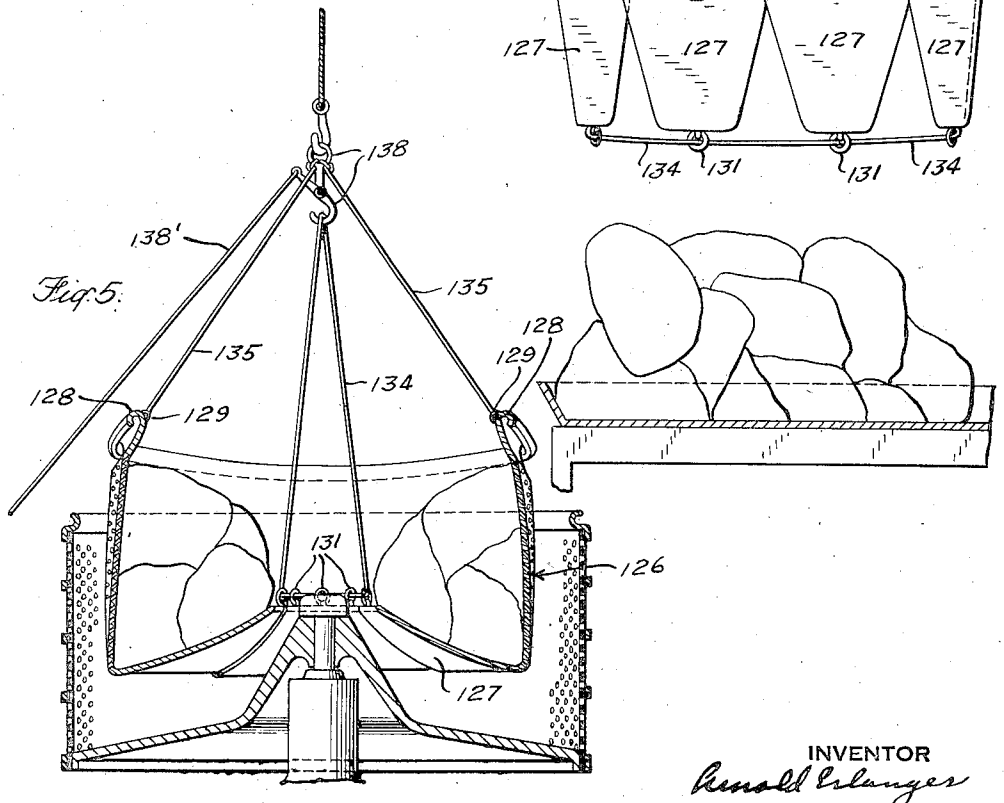


Fig. 5.



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UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR REMOVING WATER FROM CLOTHES

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Application March 3, 1931, Serial No. 519,790

8 Claims. (Cl. 210—76)

This invention relates to laundry methods and apparatus for removing water from clothes.

An object thereof is to formulate a simple and practical method for wringing clothes.

Another object is to formulate a simple and efficient method for wringing and removing clothes from centrifugal laundry extractors.

Another object is to provide means for facilitating handling of the "wash" during certain stages of its passage through the laundry.

A further object is to provide a simple and efficient container for holding the "wash" during the extracting operation, which container may be removed bodily from the extractor at the end of that operation, without disabling the extractor by the removal of any essential part thereof.

A further object is to provide a simple, practical and inexpensive removable container for laundry extractors, from which the "wash" may be easily and quickly released and dumped by gravity at the place where the next operation affecting the "wash" is to occur.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combination of elements, arrangements of parts and in the several steps and relation and order of the same, all as will be herein illustratively described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which is shown certain of the various possible embodiments of my invention:

Fig. 1 is a partial vertical section taken through the axis about which the extractor basket rotates, showing a preferred form of inner container and illustrating in broken lines the manner of its removal;

Fig. 2 is a sectional view of the inner container after its removal from the extractor, at a stage in its handling when the "wash" is about to be dumped upon a shake-out table;

Fig. 3 is a view illustrating the completion of the dumping operation;

Fig. 4 is a top plan view of a modified form of inner container shown in operative relation to the extractor basket;

Fig. 5 is a sectional view of the container of Fig. 4 shown in course of removal from the extractor basket; and

Fig. 6 is a side elevation of the container of Fig. 5 after the "wash" has been dumped.

Similar reference characters refer to similar parts throughout the various views of the drawings.

Passage through a laundry of clothing or other articles constituting the "wash" usually involves the accomplishment of several successive correlated operations.

After the reception, sorting, etc., the "wash" is delivered to a cylinder washing machine which receives it distributed in a plurality of different compartments, where it is washed in the presence of water containing soap or other detergent agents. At the end of the washing operation the contents of one or more of these compartments is customarily discharged into a truck, which is rolled along the floor of the laundry to a centrifugal extractor, where approximately 50% of the water is removed, after which it is taken from the extractor and transferred to a shake-out tumbler or, alternatively, to a shake-out table. Here the tightly packed and interlayered mass of moist clothes is shaken out and prepared for ironing by means of ironing machines suitable for the different kinds of articles included in the "wash".

Upon arrival at the extractor for the purpose of wringing, the "wash" is usually removed from the truck by hand and carefully placed in the basket of the extractor in such a way as evenly to distribute the load, so as to avoid an unbalanced condition of the basket during its period of rotation. The basket is then rotated at high speed until a sufficient quantity of moisture has been removed, after which the machine is stopped and the clothes are removed by hand. This last is a time-taking and tedious operation, for during extraction the clothes have become very tightly intermixed and pressed together.

In an effort to facilitate the removal of the clothes from the extractor, resort has been had, in the past, to making the regular basket of the extractor detachable from its driving mechanism through the removal of a nut or the manipulation of other mechanical locking devices, and in some instances specially constructed extractor baskets, removable from the extractor for unloading, have been used; but whether the baskets were of the regular standard type or of special construction, they needed, in either case, to be rigidly connected with the extractor spindle, and some readily releasable locking means had to be provided to render the basket quickly detachable. By providing a removable basket, it was possible to lift the basket bodily from the machine at the end of the wringing operation and to carry it away to the station where its contents were to be re-

moved. Provision then had to be made for lifting the removed basket and turning it upside down so that the clothes might fall out. As the weight of the average load of a laundry basket, after extraction of the removable moisture, is approximately 450 lbs., exclusive of the weight of the heavy metal basket itself, it will be realized that such removal and up-ending is not easily accomplished and that as a result the advantages gained in the use of such constructions are in a great measure offset by the many disadvantages concurrent therewith. Beside the difficulty found in handling such baskets, a further disadvantage results from their use, by reason of the fact that they constitute an essential part of the extractor itself, so that after the removal of a basket from a machine, the latter becomes useless until such time as the basket has been returned to and reinstalled therein.

In order to rid the operation of unloading of the disadvantages attendant upon the use of detachable metal baskets, the present invention provides a fabric, or rubberized fabric, or other suitable inner container which is formed upon a mandrel, or in any other appropriate manner, so that the sides and bottom thereof conform naturally to the side walls and bottom of the basket of the extractor with which it is intended for use. The container is made flexible enough, however, so that after its removal from the extractor, and while in a state of suspension or after it has been lowered upon the shake-out table, certain parts thereof may be released from the suspension means, when, in one form thereof, the container will turn inside out to permit the "wash" to fall by gravity upon the shake-out table, or, if desired, into the mouth of a shake-out tumbler. In another form of the device the bottom may drop down and open out to accomplish the same desired end.

The side walls of the container are preferably made of open-mesh woven material, but may be constructed of a close-mesh rubber covered material in which a great number of thimbled or eyeletted perforations have been made. These perforate side walls lying against the side walls of the extractor basket, which are of the usual perforate construction, permit the centrifugal removal of the water contained in the "wash", as freely as if the clothes were placed directly within the extractor basket.

Referring to the drawings,

The extractor of the present invention is best shown in Fig. 1 and comprises a stationary frame **10**, supporting a stationary outer casing or curb **11**, which substantially encloses the movable extracting mechanism. A journal member or bearing unit **12** serves rotatably to support the extractor spindle **13** and is mounted upon a supporting spider **14**, which is suspended from the frame **10** by means of suspension rods **15**. These rods are provided, top and bottom, with flexible or resilient washers **16** adapted to permit the spider **14** and the extracting mechanism mounted thereon to oscillate independently of the supporting casing **11**, thus in a measure providing compensation for unbalanced basket loads.

Any suitable driving element, such as an electric motor **17**, is provided to rotate the spider **14**. An extractor basket **25** is rigidly mounted upon the spindle **13** and comprises a casting **18** forming the bottom of the basket, a casting **19** forming the upper lip or edge of the basket, and a perforated side wall **20** of cylindrical conformation, the latter being supported by reinforcing bands **21**. The basket is coupled to the spindle for rotation therewith by means of any suitable key **22** and is held in its properly seated position upon the tapered spindle by means of a flanged nut **23** threaded upon the end of said spindle.

The usual method of operation of an extractor of this type when it is used as a laundry wringer, is as follows: The wet clothes from the washing machine are placed in the basket, the motor is started and the spindle and basket set in rapid motion. The centrifugal action causes the load to move over against the perforated wall of the basket and assume somewhat the position indicated by broken line **40** in Fig. 1; and the water to be thrown outwardly from the clothes through the perforations and delivered to the interior of the curb **11**, from which it may be drained in any suitable manner. When the operation is finished the motor is stopped and the basket brought to a standstill, when the clothes may be removed by hand.

This method of operation is radically changed in carrying out my invention, by first placing within the extractor basket an inner container, indicated generally by the numeral **25**. As stated in the foregoing general discussion, this container is of semi-flexible construction, and is molded or formed to provide a normally upright cylindrical wall **26** and an inwardly and upwardly extending bottom portion **27**, shaped to conform respectively to the side wall, bottom and hub of the basket. At its upper edge the container wall **26** is turned over to provide a lip **28** adapted to fit over the edge of the basket rim member **19**, and this lip is provided with a plurality of spaced eyes or grommets **29** for engagement with a suitable suspension means, whereby the removal of the basket may be easily accomplished. A circular opening **30** is provided at the center of the annular bottom portion **27**, adapted to fit over the hub of the basket, and the edge of the material about this circular opening is provided with a plurality of grommets **31** securely attached thereto, also for the purpose of permitting attachment of a suspension means.

The side wall **26**, as mentioned above, is open-meshed or perforated to make it readily pervious to water and, along the line where the wall **26** joins the bottom portion **27**, the material is distorted or given a permanent set, as indicated at **32**.

In loading and unloading the extractor, according to my invention, the container **25** is placed in the extractor basket so as nicely to fit the interior of the sides and bottom thereof, the lip **29** being caught over the edge **19** of the basket. The wet clothing or other articles are carefully placed within the container, the extractor cover (not shown) is closed and the basket set in motion. Water is now driven out through the perforated sides of both container and basket until the "wash" becomes sufficiently dry, when the basket is brought to rest and the cover is thrown back out of the way. For removing the container from the extractor basket a special sling may be provided, comprising a ring member **33** to which is attached a plurality of relatively long ropes or chains **34** and a plurality of short ropes or chains **35**. Each sling member **35** is provided at its free end with a hook **36** adapted to engage the eye of one of the grommets **29**, and the lower end of each of the suspension members **34** is made fast to the eye of one of the grommets **31**, or, if preferred, the members **34** may be provided with hooks at their lower ends similar to hooks **36**.

The sling supported by its ring **33** from a hook **38** carried by a suitable trolley hoist (not shown), is brought over and down to the container **25** and its hooks made fast thereto in the proper manner, or, alternatively, the sling may be left in the container during the extracting operation and attached to the hoist hook **38** when it is desired to remove it.

The hoist is now operated to lift the container with its load of clothes bodily from the extractor basket and to transport it to the shake-out table, indicated in Figs. 2 and 3 by the numeral **39**. As tension is put upon the suspension cords **35**, the outer walls of the container are drawn in somewhat, as shown by broken lines in Fig. 1, which provides clearance enough for the ready removal of the container from the basket. At the shake-out table the hooks **36** are released from the eyes **29** and the outer edge **28** of the side wall is drawn down by the weight of the load until the container assumes somewhat the condition shown in Fig. 3, when the load is deposited upon the top of the shake-out table. As mentioned above, the container may be allowed to rest lightly on the shake-out table so as to provide slack enough to facilitate the unhooking of the sling members **35** from the eyes **29**, but it is perfectly practicable to furnish trip hooks for engagement with these eyes so that they may be released even while under tension.

When empty, the flexible container may be set down out of the way or be returned to the extractor, but in any case, it should be understood, the extractor need not remain idle for more than a brief interval of time. As soon as one container has been removed from the extractor another may be substituted, and the machine again put in operation. Such a method of operation would not be practicable with constructions made as heretofore, where the regular basket of the extractor was made removable, for the expense of maintaining extra baskets for each extractor would be prohibitive. In the case of such constructions the machine is, in the absence of the basket put entirely out of commission, since the basket is an essential part thereof. With the device of the present invention, however, even were there no extra container handy, the machine could be operated in the usual way, with the extractor basket holding the clothes.

In Figs. 4, 5 and 6 is illustrated a modified form of inner container, comprising a pervious body portion **126**, having an upper edge **128**, supplied with suspension eyes **129**. These eyes are attached to suspension cords **135**, which may be made removable with respect either to the container itself or the hoist hook **138**. The bottom portion of the container or bag, as it may be called, comprises a plurality of overlapping flaps **127**, each of which is provided with a ring **131** through which a pair of draw-cords **134** and **134'** are reeved. These draw-cords, when thrown over the hook portion of the trip-hook **138**, and when the container is suspended from the hook, draw the flaps **127** upwardly and inwardly to close the bottom of the container, as is indicated in Fig. 5. In this position it is placed within the extractor basket.

During extraction the draw-cords **134** and **134'** will lie on the bottom of the container beneath the clothes. When moved in its suspended condition to the shake-out table, the trip portion of hook **138** may be released from the draw-cords by jerking the operating cord **138'**. This will release the draw-cords and permit the flaps to descend beneath the weight of the load, dumping the load upon the shake-out table, as indicated in Fig. 6.

While it is not necessary in either form of the invention to mold the container to the shape of the extractor basket, it has been found preferable to do so, for it facilitates placing the container properly within the basket and also makes it more easily handled and operated. It should be noted that applicant does not confine himself or wish to be limited to any particular manner of suspending the container in its closed condition, or to any specific means for releasing the suspension cords when it is desired to dump the load.

From the foregoing it will be seen that applicant has formulated a process well adapted to attain the objects set forth above and has provided a simple and inexpensive removable baglike container adapted to hold the "wash" during the wringing operation, without hindering the efficiency of extraction, which container may be readily emptied without the aid of complicated machinery for turning it upside down.

As many possible embodiments may be made of the above invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. In apparatus of the character described, in combination, an extractor for wringing clothes comprising a perforate basket, and a removable container serving to line the basket and hold the clothes during the operation of the extractor and adapted to be lifted with its contents bodily from the extractor basket, said container being formed of a perforate rubberized fabric material.

2. A centrifugal laundry-drying machine including in combination a perforate centrifugal basket rotatably mounted within a casing, a flexible bag-like container shaped to fit within the basket and means for removing the container and its contents from the basket comprising a semi-flexible, flanged supporting ring that can be turned inside out at the top of the container shaped to gravitally support the upper rim of the container upon the rim of the basket and means for lifting said ring from the basket rim to remove the container and its contents from the basket.

3. A centrifugal laundry-drying machine including in combination a perforate centrifugal basket rotatably mounted within a casing, a flexible bag-like container having a semi-flexible top ring by which it is attached to the basket shaped to fit within the basket, means for lifting the container and its contents from the basket, and means for turning the bag and the top ring inside-out to empty the contents thereof.

4. A centrifugal laundry-drying machine including in combination a perforate centrifugal basket rotatably mounted within a casing, a flexible bag-like container having a semi-flexible top ring by which it is attached to the basket shaped to fit within the basket, means for lifting the container and its contents from the basket, and means for turning the bag and the top ring inside-out to empty the contents thereof comprising supporting devices connected to the upper rim of the container and additional supporting devices connected to the bottom of the container and means for releasing the rim support while continuing to support the bottom, and thereby causing the upper part of the container to col-

lapse and reverse the container and the top ring.

5. In a laundry centrifugal extractor, in combination, an underdriven basket, a pervious lining for the basket, a top ring of flexible material removably fitted around the upper edge of the basket and attached to the lining, hoisting means, connecting elements from the hoisting means to the basket top ring for lifting the top ring vertically and axially; other connecting elements to the central portion of the lining and the basket load; means for releasing one set of connecting elements to drop the basket load.

6. In a laundry centrifugal extractor, in combination, an underdriven basket, a pervious lining for the basket having a top ring resting upon and supported by the top edge of the basket, said top ring being formed of semi-flexible, resilient material capable of turning inside out.

7. A centrifugal laundry drying machine including in combination a perforate centrifugal basket, having a rigid top rim on the upper edge of the basket, rotatably mounted within a casing, a flexible bag-like container to fit within the basket, a flanged, semi-flexible annular lip attached to the bag and adapted to be fitted over said rim for supporting the bag.

8. For use in a centrifugal laundry drying machine, a flexible bag-like container to fit within a centrifugal basket, said container having side walls of perforate, resilient material, an annular semi-flexible lip at the top edge of the side walls and formed integrally therewith by which the container may be supported.

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