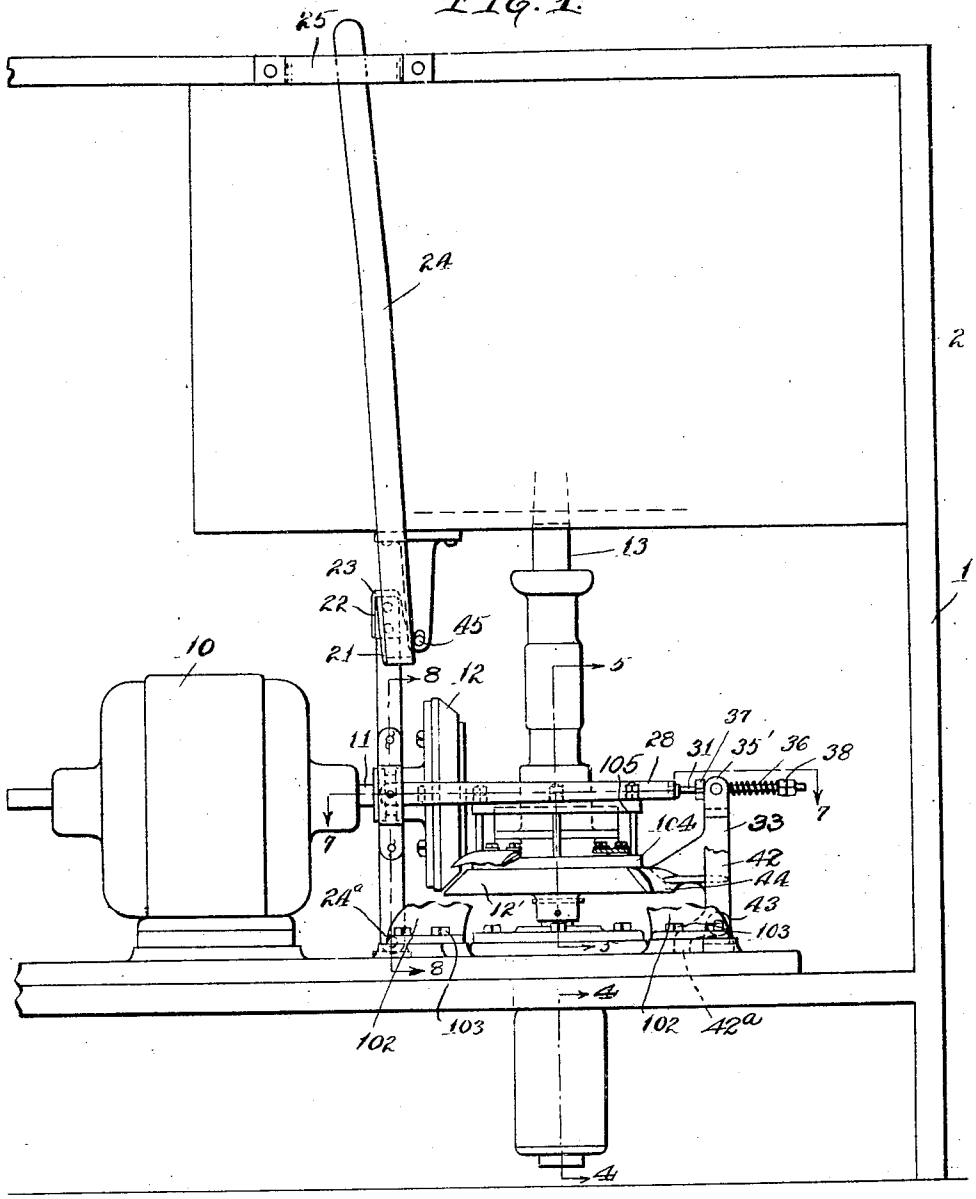
July 15, 1924. 1,501,642

D. H. BENJAMIN

CENTRIFUGAL EXTRACTOR

Filed July 26, 1920 4 Sheets-Sheet 1

FIG. 1.



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FIG. 3.

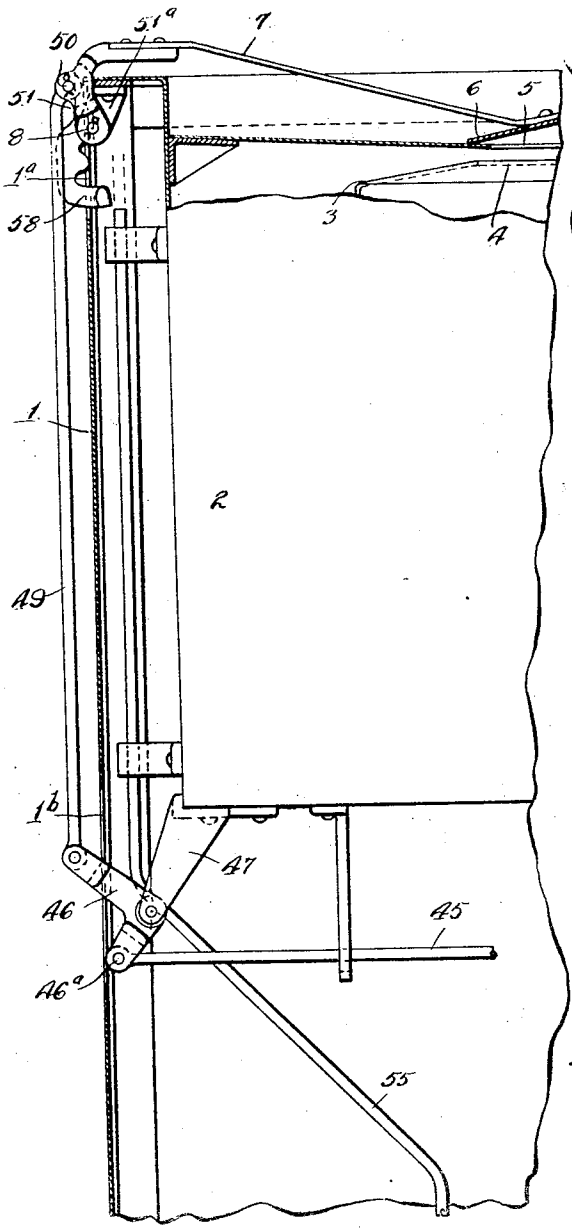
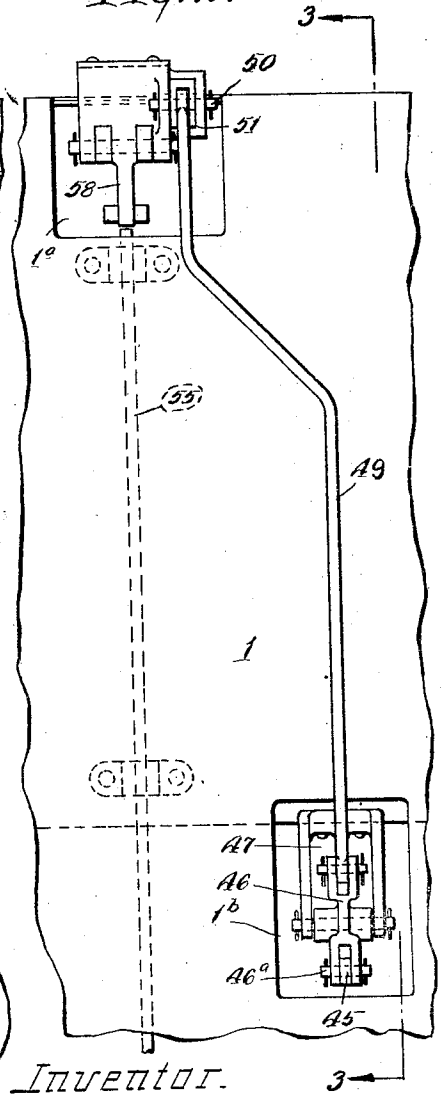


FIG. 2.



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FIG. 4.

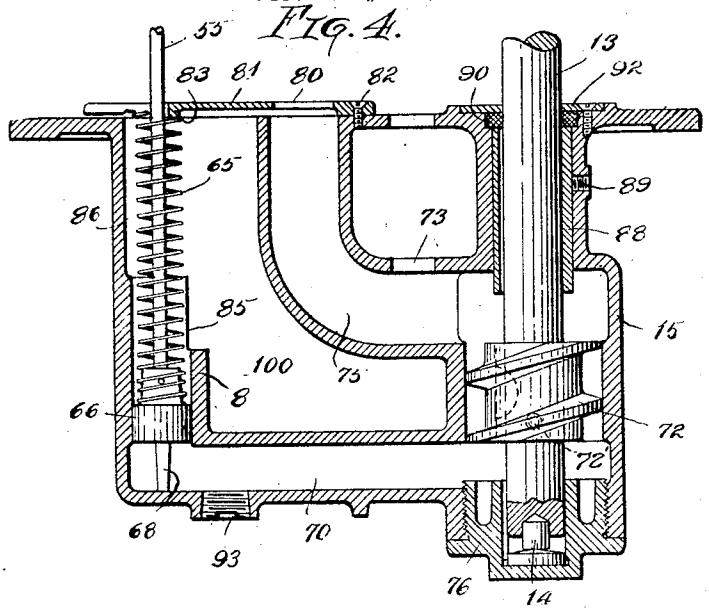
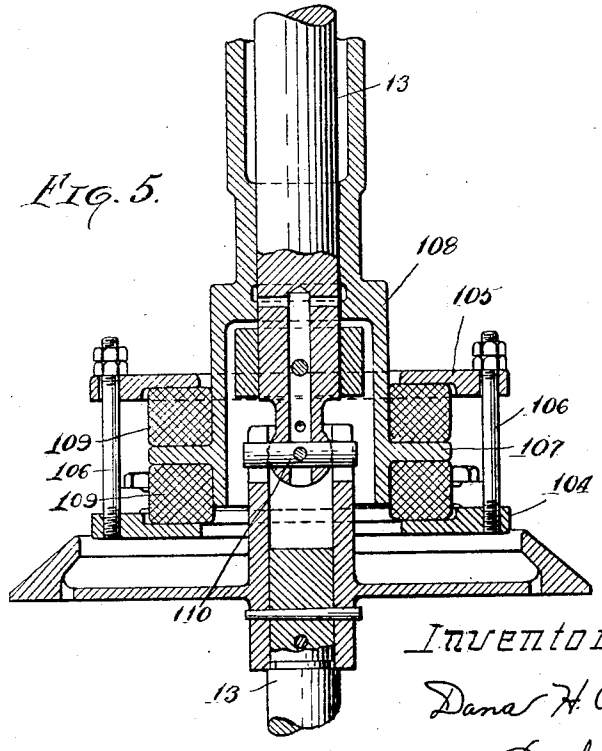


FIG. 5.



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Filed July 26, 1920 4 Sheets-Sheet 4

FIG. 7.

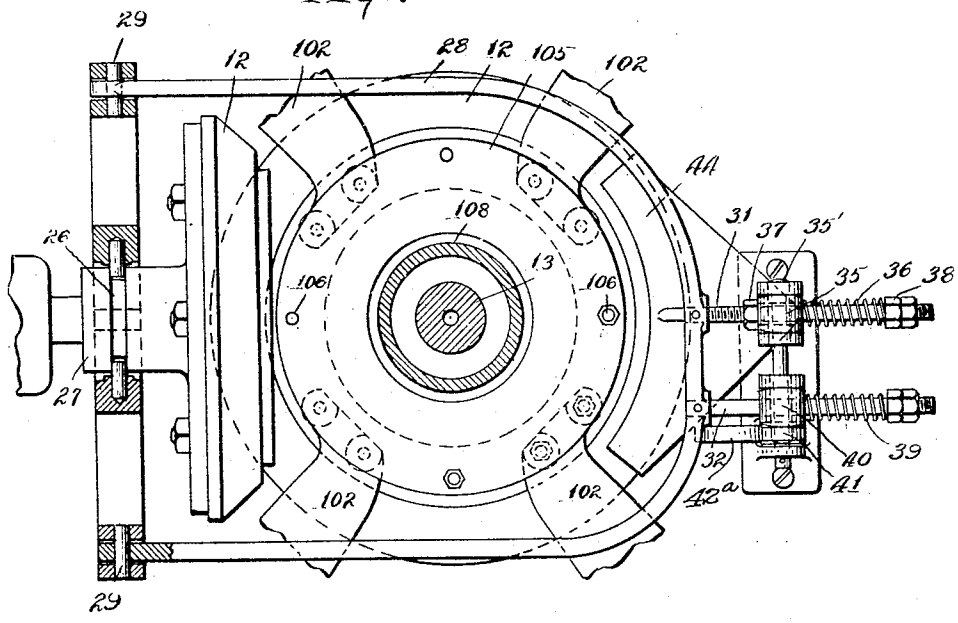


FIG. 8.

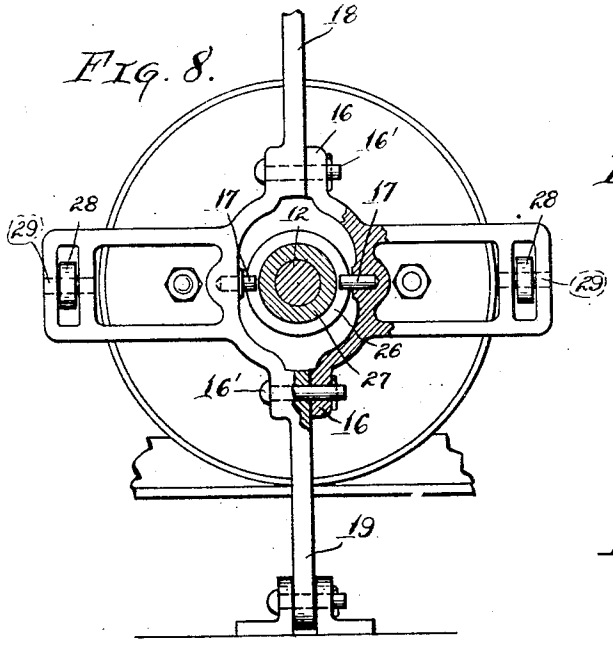
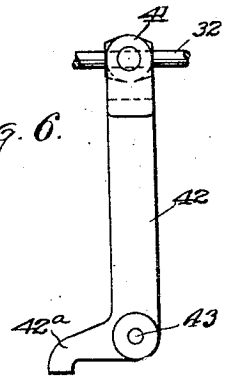


FIG. 6.



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Patented July 15, 1924. 1,501,642

UNITED STATES PATENT OFFICE.

DANA H. BENJAMIN, OF CLEVELAND, OHIO, ASSIGNOR TO HENRIETTA C. BENJAMIN, OF CLEVELAND HEIGHTS, OHIO.

CENTRIFUGAL EXTRACTOR.

Application filed July 26, 1920. Serial No. 399,211.

To all whom it may concern:

Be it known that I, DANA H. BENJAMIN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Centrifugal Extractors, of which the following is a specification.

This invention relates to centrifugal extractors, such as are used for removing moisture, water, or other liquids from textile fabrics, clothing or other materials. The invention has particular relation to safety devices for protecting the operators of such extractors.

The object of the invention is to provide improved safety mechanism for controlling or locking the cover of the rotating basket, to prevent access to said basket when the same is rotating and to prevent the basket from being started when the cover is open.

A further object of the invention is to provide a brake for the rotating basket with such safety mechanism so that the two will cooperate in the proper manner.

A further object of the invention is to provide an improved form of safety mechanism controlled by the rotation of the rotating basket or spindle, and preferably actuated by hydraulic pressure, such mechanism being of simple form, inexpensive to install, capable of embodiment in any form of extractor, and not likely to get out of order in service.

Further objects of the invention are in part obvious and in part will appear more in detail hereinafter.

The invention comprises the construction and arrangement of parts hereinafter described and claimed.

In the drawings, Fig. 1 represents a front elevation, partly broken out and in section, of one form of mechanism embodying the invention; Fig. 2 is a detail rear elevation of the locking mechanism on a larger scale; Fig. 3 is a sectional elevation on the line 3—3, Fig. 2; Fig. 4 is a sectional elevation on a larger scale on the line 4—4, Fig. 1; Fig. 5 is a detail section on the line 5—5, Fig. 1; Fig. 6 is a detail elevation of the rest member; Fig. 7 is a sectional plan view on substantially the line 7—7, Fig. 1; and Fig. 8 is a sectional elevation on line 8—8, Fig. 1.

The extractor shown in the drawings comprises a suitable frame 1 enclosing a stationary curb or casing 2 having an inner chamber in which is located the rotating basket 3, the outer wall of which is of perforate or foraminous form, as is usual in this type of extractor. Said basket has a central opening 4 in its top wall through which it is loaded and unloaded, access to said opening being had through a registering opening 5 in the stationary curb or casing which is closed by the door 6 carried by an arm 7 hinged at 8 to the frame.

The spindle 13 for operating the basket may be mounted in any suitable manner and in this construction is driven by an electric motor 10 whose shaft 11 has connection through clutch members 12 and 12′ with the spindle. A brake mechanism indicated at 42 is also provided for co-operation with the clutch member 12′. The engagement of the clutch is controlled from the lever member 24 and a rod 45, connected with the cover of the basket, is so arranged that when the cover is open this rod 45 extends past the side of the lever member 24, as indicated in Fig. 1. When in this position the rod 45 prevents the operation of lever arm 24 which means that the clutch cannot be closed for operation of the spindle 13. In this way operation of the basket is prevented while the cover is open, thereby preventing the operator from being injured by contact with the moving mechanism inside of the basket. The brake 42 is connected with the clutch operating means so that clutch and brake can be controlled by a single operation, as will be later explained.

As shown in Fig. 1 of the drawings, the upper end of the lever arm 24 extends through a strap 25 upon the frame so as to be easily accessible to the operator. The lever arm 24 is bent back as indicated at 21, then extends at an angle upwardly at 22, then extends substantially horizontally as indicated at 23, then downwardly to the point of pivotal connection upon the base as indicated at 24ª. Those parts of the lever arm indicated at 18 and 19 are extensions from one part of a yoke, this part being secured to the other part which has shorter arms indicated at 16. These two parts are secured together by bolts 16′ and carry upon their inner faces pins 17 for co-operative engagement with groove 26 in the collar 27 of the clutch member 12. The yoke members

just referred to extend laterally so as to provide means for connection with the end portions of a U-shaped yoke member 28, these points of connection being indicated at 29.

The yoke 28 extends about the spindle and is connected at its curved portion with two rods 31 and 32, as clearly shown in Fig. 7. The rod 31 is connected at a point on the middle line through the U-shaped member 28, sufficient tangent being provided in the bent end portion of this member to provide attaching means also for the rod 32. Rod 31 extends through a collar 35 which has pivotal connection with the clevis member 35′ on the upper end of the lever member 33. This lever member is pivoted freely upon the shaft 43 and carries a brake shoe 44. A nut 37 upon the rod 31 limits the movement of collar 35 in one direction so that the brake will be applied through the spring upon operation of lever 24. This nut serves also to abut the collar 35 and thus cause the brake to be released when moved to the right as viewed in Fig. 1. A spring 36 surrounding the rod 31 extends between the collar member 35 and the nut 38 upon the extreme end of rod 31. The rod 32 receives collar 40 which has pivotal connection with the clevis member 41 on the upper part of the lever member 42. The member 42 is freely mounted on shaft 43 and has a foot 42^a which limits its forward movement and causes tension upon spring 39 which extends between collar 40 and the nut on the end of the rod 32.

The operation of the structure just described is as follows:

Assuming the cover to be open and the end of the rod 45 to extend just past the lever arm 24, in which position the clutch is disengaged and the brake shoe is in engagement. Then in order to throw in the clutch and remove the brake it is necessary to first lower the cover so as to remove the rod 45 from the path of the lever arm 24, whereupon the clutch is closed through tension of the spring 39, and at the same time the brake is released. The parts remain in this position during operation of the machine and it is impossible to open the cover during this time since the lever arm 24 extends across the path of the rod 45 and thus prevents the projection of said rod which is necessary in order for the cover to be opened. Then when it is desired to raise the cover it is first necessary to shift the lever arm 24 out of the path of arm 45, that is to say, in a direction to the left, as viewed in Fig. 1 of the drawing. As the lever arm 24 is moved to the left, it gives like movement to the U-shaped yoke 28 and with it the rods 31 and 32. The rod 31 causes movement of the collar 35 and hence the brake shoe 44 by causing tension upon the spring 36. At the same time rod 32 moves to the left and causes tension upon the spring 39, as will be readily understood from the drawings. The tension which is in this way placed upon the spring 39 is sufficient to cause engagement of the clutch upon release of the lever arm 24, as above stated.

The mechanism will now be described by which it is impossible to open the cover of the basket while the spindle is rotating. As will be seen from Fig. 4, the spindle 13 carries a pump screw 72 which is secured thereto by set screw 72′, the function of this screw 72 being to force a head of fluid, as for instance oil, against the under side of the piston 66 for the purpose of raising the rod 55. The housing 15 which encloses such mechanism is suitably attached to the underside of the frame as indicated in Fig. 1, the rod 55 passing up through the machine support and being offset so as to extend up towards the arm 58 carried by the cover as shown in Fig. 3. An opening 80 allows oil or other fluid to be supplied through the pipe 75 from which it passes to the screw 72. As will be observed, the screw 72 is designed for proper rotative relation with that part of the housing immediately surrounding it so that it will carry a head of oil downwardly and force the same through the restricted passage-way 70 to the under face of the piston 66. The piston 66 has a suitable foot 68 which allows it to be properly spaced from the bottom of the casing. The piston 66 is adapted to have vertical movement through the barrel 86 provided in the casing, an opening 85 leading from the barrel into the chamber 100 which surrounds the pipe 75. A port 73 in the side of the pipe 75 allows communication between the chamber 100 and this pipe which feeds the oil to the screw 72. Thus it will be seen that the oil after being forced upwardly behind the piston 66 returns through the opening 85 to the chamber 100 and thence through the port 73 back to the screw 72 to be recirculated over the same course.

The piston 66 is forced upwardly against the tension of a spring 65 which has its lower end attached to the piston rod 55, while its upper end is secured about the projection 83 formed upon the under side of the plate 81. This plate 81 is secured to the top of the casing by means of screw 82 and has a filling aperture registering with the aperture 80 in the casing. A drain plug 93 is provided in the bottom of the casing and an opening is also provided in the casing just below the worm so that the spindle can be removed from the casing. A suitable screw closure 76 is provided for this opening and a bearing member 14 is provided in the bottom thereof for the spindle 13. The collar 88 is provided between the spindle and the casing with a set screw 89 for securing

the same in position. A bushing 90 is provided about the spindle and a closure disk 92 is also provided for securing the bushing in proper position.

When the rod 55 is given upward movement, as above explained, it is caused to assume the position indicated in dotted lines in Fig. 3. When in such position it is impossible to open the cover of the basket since the arm 58 which is carried by the cover will strike against the rod 55 and will therefore be locked against movement. When the spindle 13 has come to rest, however, the rod 55 will be allowed to fall to the position shown in Fig. 4, and this rod will no longer intercept the path of the arm 58; at which time it will be possible for the cover to be raised since there is no obstruction to the movement of the arm 58 through the path indicated by dotted lines in Fig. 3. This arm 58, as shown in Fig. 3, forms part of the arm 51 secured to the arm 7 of the cover 6.

The rod 45 above referred to has pivotal connection at 46[a] with one end of a bell crank lever 46 whose fulcrum is mounted upon the bracket 47 depending from the curb. The other end of this bell crank lever is pivotally connected to the vertically disposed rod 49 which has pivotal connection at 50 with the arm 51. Lever 46 extends out through an opening 1[b] in the frame 1 and the arm 51 is pivoted on bracket 51[a] on the frame, an opening 1[a] in the frame allowing extension of the parts therethrough.

Suitable supporting brackets 102 which are secured at 103 to the base plate in the frame support at their upper ends the lower annular plate member 104 which is a complement of the upper annular plate member 105. The rods 106 which extend upwardly from the lower member 104 support the upper member 105. An annular extension 107 is provided upon the collar member 108 which surrounds the spindle and this extension 107 is adapted to cause compression of the cushioning disks 109 which are arranged between the extension 107 and the upper and lower members 104 and 105. A universal joint 110 is provided in the spindle so that extreme oscillating movement of the basket during its initial starting period will be prevented by engagement of the extension 107 against the cushioning members just referred to. A fuller understanding of the feature just described can be had from my co-pending application No. 295,310 filed May 7, 1919.

The advantages resulting from my invention will be obvious, so it is thought, especially the safety means which I have provided, whereby the cover cannot be raised until the spindle has ceased operation, and also the means which makes it impossible to throw the clutch into operative engagement while the cover is in open position; both of which features make it impossible for the operator to suffer injury from contact with the moving parts inside of the rotating basket.

What I claim is:

1. In an extractor, the combination of a curb, a cover therefor, a rotatable basket in said curb, means for operating said basket, a liquid containing system, means for producing pressure in said system upon operation of said basket, and a cover lock actuated by pressure in said system whereby opening of said cover during operation of said basket is prevented.

2. In an extractor, the combination of a curb, a cover therefor, an arm actuated by said cover and adapted to move through a definite path upon opening of the cover, a rotatable basket in said curb, means for operating said basket, a rod adapted to intercept the path of said arm, a liquid containing system, a pump operated by said basket operating means for producing pressure in said system upon operation of said basket, and a piston actuated by pressure in said system for actuating said rod to thereby lock said arm against movement and prevent opening of said cover during operation of said basket.

3. In an extractor, the combination of a curb, a cover therefor, a basket in said curb, a driving member for operating said basket, clutch and brake mechanisms diametrically opposed with reference to said driving member for controlling the same, means for actuating said clutch and brake mechanisms, and means operatively connected with the cover for locking said actuating means in operative position while the cover is opened, thereby preventing operation of said basket while said cover is open.

4. In an extractor, the combination of a curb, a cover therefor, a basket in said curb, a driving member for operating said basket, clutch and brake mechanisms diametrically opposed with reference to said driving member for controlling the same, means having operative connection with said clutch and brake mechanisms, means connected with one of said mechanisms for actuating the same, and means operatively connected with the cover for locking said actuating means in inoperative position while the cover is open, thereby preventing operation of the basket while said cover is in open position.

5. In an extractor, the combination of a curb, a cover therefor, a basket rotatable in said curb, a spindle for operating said basket, clutch and brake mechanisms oppositely arranged with respect to said spindle for control thereof, a yoke member extending about said spindle and having operative connection with said clutch and brake mechanisms, means connected with one of said mechanisms for actuating the same, and

means operatively connected with the cover for locking said actuating means in inoperative position while the cover is open, thereby preventing operation of the basket while said cover is in open position.

6. In an extractor, the combination of a curb, a cover therefor, a basket rotatable in said curb, a spindle for operating said basket, clutch and brake mechanisms oppositely arranged with respect to said spindle for control thereof, a yoke member extending about said spindle and having operative connection with said clutch and brake mechanisms, a yieldable connection between said brake mechanism and yoke member, a pivotally mounted stop member having spring connection with said yoke member whereby release of said clutch will place said spring under tension, thereby producing a tendency for the clutch to close, means connected with one of said mechanisms for actuating the same, and means operatively connected with the cover for locking said actuating means in inoperative position while the cover is open.

In testimony whereof I affix my signature.

DANA H. BENJAMIN.