

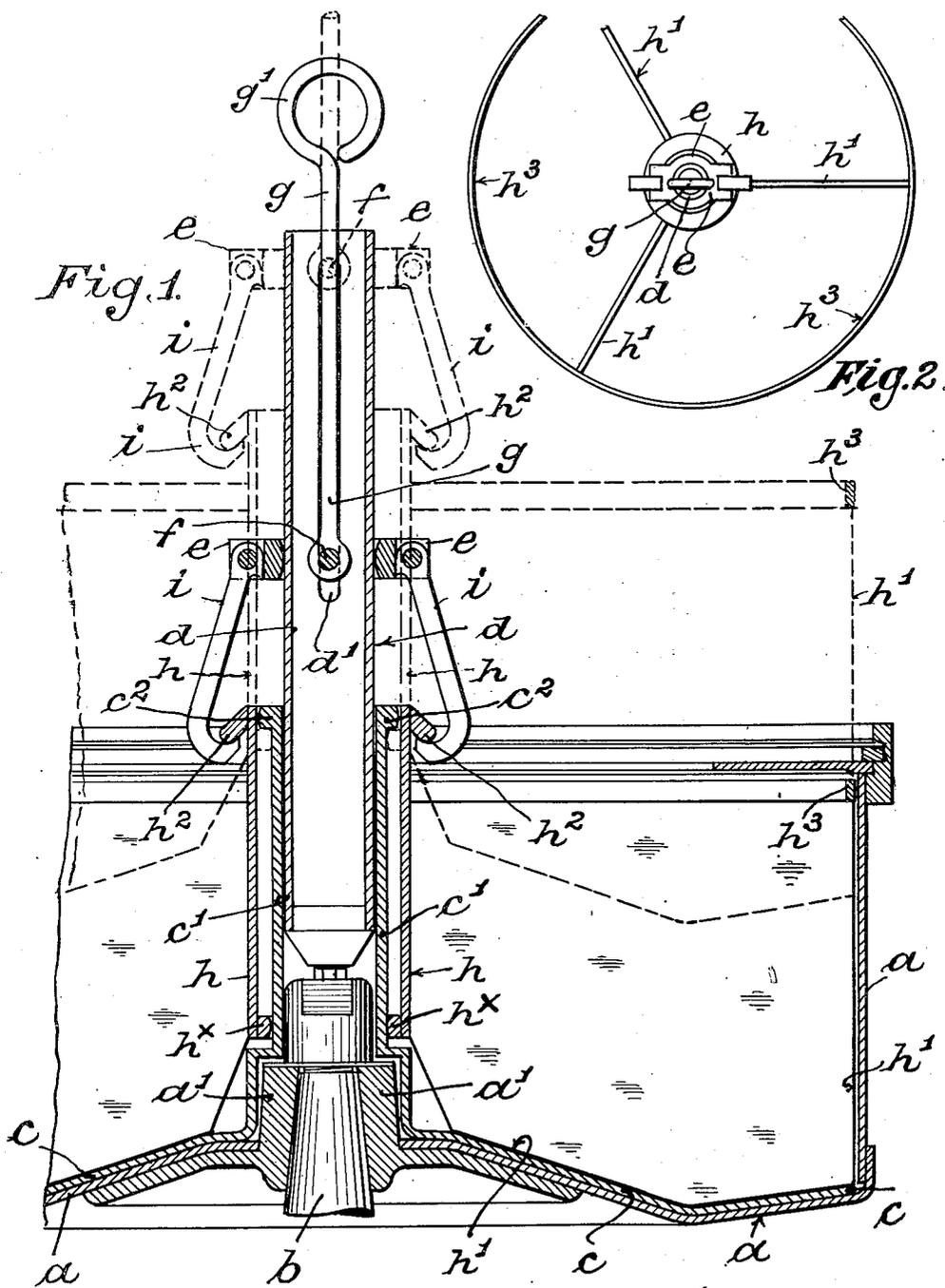
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HYDROEXTRACTOR

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HYDROEXTRACTOR

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The invention relates to hydro-extractors and whilst it has particular reference to machines of the kind referred to as constructed for use in laundries, machines embodying or constructed according to the invention will be equally advantageous for other uses, as for instance for dealing with textiles of various kinds, paper and other pulp, and other materials.

In such machines it is desirable to provide means which will facilitate the proper loading of the machine basket with clothes or other material to be centrifuged and for enabling the material to be rapidly discharged when the centrifuging operation is complete. It is further desirable that the discharge arrangements shall be such as to obviate any possibility of damage to the material.

The present invention has for its object to provide a hydro-extractor possessing the desirable features above mentioned and which will, moreover, enable the discharging of the centrifuged material to be effected more quickly than hitherto.

A machine according to the invention is characterised inter alia by the provision of a false bottom for the basket, with lifting means whereby such false bottom can, when desired, be raised clear of the top of the basket to permit of the discharge of centrifuged material. Associated with this false bottom is a series of dividing plates, say three in number, spaced at equal distances apart circumferentially and serving, when in position in the basket and resting upon the false bottom, to divide the interior of the basket into a series of separate compartments. The dividing plates are separate from and are capable of vertical movement independently of, the false bottom.

In the accompanying drawings,

Fig. 1 shows a part sectional elevation of a machine according to the invention; and

Fig. 2 is a plan view on a reduced scale.

Referring to the drawings, the basket *a* of the machine, carried in known manner on the upper end of a suitably-driven spindle *b*, is adapted to receive a false bottom *c* which is fashioned to rest upon the bottom proper of the basket *a* and is provided with a central upstanding tubular boss or sleeve *c'*, the lower end of which fits over and is centralised by an upstanding central boss *a'* on the basket bottom.

Fitting and slidable within the upper end of the tubular boss or sleeve *c'* is a tubular member *d* which, near its upper end, is provided with two diametrically-opposed slots *d'* of suitable length.

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A collar *e*, encircling the tubular member *d*, and a transverse pin *f* passed through openings in this collar and through the slots *d'* in the member *d*, has pivotally connected to it the lower end of a lifting rod *g*, provided at its upper end with an eye *g'* or its equivalent for connection to manually-operated or power-operated raising and lowering means.

Surrounding and spaced from the tubular boss or sleeve *c'* is an outer sleeve *h* which is guided for vertical movement on the sleeve *c'* by an external collar *c²* at the upper end of the said sleeve and by an internal collar *h²* at its own lower end.

The outer sleeve *h* carries a series, in this instance three in number, of circumferentially-spaced and radially-extending dividing plates *h'*, which are of appropriate depth in relation to the basket *a* and are of such radial length as to fit nicely within the basket. The lower edges of the dividing plates *h'* are, as shown, shaped to fit correctly upon the false bottom *c* when the latter is in lowered position in the basket.

A series of hooks such as *i* carried pivotally by the collar *e* are adapted to be engaged, as shown, with an annular inclined flange *h²* on the exterior upper end of the outer sleeve *h* by which the dividing blades *h'* are carried.

When the basket is to be charged with material to be centrifuged, the false bottom *c* is lowered, as shown, to rest upon the bottom proper of the basket and the outer sleeve *h* is lowered until the lower edges of the dividing plates rest on the false bottom. When the false bottom and dividing plates have been thus positioned in the basket, a short continued downward movement of the lifting and lowering rod *g* preferably operated by power means, not shown in the drawing enables the hooks *i* to be swung outwardly by manual action clear of the annular inclined flange *h²* on the outer sleeve *h*. The rod *g* can now be moved upwardly with the hooks held away from the flange *h²*, to carry the inner tubular member *d* and the hooks *i* up with the rod and clear of the basket, leaving the machine ready, when it has been charged, for closing down on the usual cover, not shown, for the centrifuging operation. The raising of the tubular member *d* is effected, as will be understood, by engagement of the pin *f* with the upper ends of the slots *d'* as the rod *g* moves upwardly.

When centrifuging is finished, the cover is raised and the rod *g* lowered until the hooks *i* can engage or be engaged beneath the flange *h²*. At this time the pin *f* is, as shown, at or near the lower ends of the slots *d'* in the member *d*.

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The rod g is now raised, which causes the hooks i to raise the outer sleeve h , and thus also raise the dividing blades h' as indicated in dotted lines in Fig. 1. The reason for lifting out the dividing plates before the false bottom is raised is that when the blades are so lifted out gaps are left between the segments of clothes where the plates were. By the time the blades have been raised clear of the clothes or like material the internal collar h^x on the sleeve h will have reached the position indicated in dotted lines, so that continued upward movement of the rod g now causes, by the engagement of the collar h^x beneath the collar c^2 on the sleeve c' , also the false bottom c to be raised along with the now-freed segmental separated charges of clothes or like material resting upon it. Thus, when the false bottom is raised to carry the clothes up clear of the basket, the "wedges" of clothes can move inwardly a sufficient distance to reduce to a minimum rubbing against the inner surface of the basket. Moreover, if the wedges or segments are pushed inwardly before the false bottom is lifted, this detaches the clothes from the perforations in the basket wall and reduces risk of the clothes being damaged. When the false bottom has been raised to the level of or clear of the top of the basket the separated charges of material can be peeled away outwardly to fall into a receiving receptacle.

A feature of importance is the provision, at the upper ends of the dividing blades h' , of an encircling ring h^3 secured to the outer extremities of the blades, such encircling ring serving to constitute, with the blades and the sleeve h carrying them, a rigid structure which prevents the blades from becoming distorted or bent by the forces exerted upon them whilst centrifuging. A further feature of advantage accruing from the construction described is that, due to the height of the actual suspension point above the false bottom c when the latter is raised clear of the basket, liability to tilting of the assembly during removal of centrifuged material is reduced to a minimum.

Whilst the particular embodiment described above is good and practical it will be obvious that the details of construction are capable of variation by any competent designer within the scope of the invention.

It will be appreciated that when, after a batch of clothes or similar material has been centrifuged in a machine according to the invention, the removal of the dividing plates leaves between each two adjacent compartmented-charges of material a space equal to the thickness of a plate. This as already intimated, allows the charges of material or clothes to move radially inwards a small distance sufficient to obviate or to reduce to a negligible amount, friction between the outer positions of the centrifuged clothes and the inner surface of the basket.

The wall of the basket is usually provided with a plurality of relatively small openings through which, during the centrifuging operation, the separated liquid can escape. During the centrifuging operation, the portions of the material bearing against the wall of the basket become pressed into these holes and if, as hitherto, the material is moved forcibly upwards in the form, as it were, of a solid ring over the interior surface of the basket, there has been a danger that, with certain materials, damage might be caused.

In a machine according to our invention, however, the permissible radially-inwards movement of the segmental separated charges of material

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obviates or reduces to a minimum any possibility of damage to the material as it is being raised out of the basket.

Having thus described my invention, what I now claim as new and desire by Letters Patent is:

1. A hydro-extractor comprising in combination a basket; a false bottom for such basket; an inner sleeve extending up centrally from the false bottom; a tubular member fitting slidably within said sleeve; two diametrically-opposed longitudinal slots provided in said sleeves; a collar surrounding said tubular member and secured thereto; a pin extending transversely through said collar and said slots of the tubular member; pivotally-mounted hooks depending from said collar; an outer sleeve surrounding and spaced from said inner sleeve; a series of dividing plates carried by said outer sleeve and extending radially outwards from the same and reaching substantially to the wall of the basket; catches provided on the exterior of said outer sleeve for engagement by said depending pivoted hooks upon upward movement of said tubular member; cooperating abutments arranged exteriorly at the upper end of said inner sleeve and interiorly at the lower end of said outer sleeve, the said abutments extending into the same vertical plane; and lifting means engaging the said pin so that raising of said pin operates first to raise the dividing plates clear of the material in the basket and thereafter to raise the false bottom on which the material rests.

2. A hydro-extractor including the combination of a basket; a false bottom for said basket; a series of circumferentially spaced vertically movable radial dividing plates; vertically movable releasable engagement means for raising and lowering said plates; and two vertically movable cooperative engaging portions, one of said engaging portions having means engageable by said releasable engagement means and being connected to said plates and the other engaging portion being connected to said false bottom, and the two engaging portions being relatively vertically spaced a predetermined distance apart so as to be out of mutual contact engagement when said plates are in the lowermost position and so as to come into relative mutual contact engagement during upward movement of said plates whereby said false bottom will be raised after said plates have been lifted through the predetermined distance.

3. A hydro-extractor including the combination of a basket; a false bottom for said basket; a series of circumferentially spaced vertically movable radial dividing plates; a first vertically movable upstanding member rigidly connected to said plates; a second vertically movable upstanding member rigidly connected to said false bottom; vertically movable downwardly releasable engagement means capable of acting on said first upstanding member for raising and lowering said plates; and cooperative engaging portions provided on said upstanding members, the said engaging portions being relatively vertically spaced a predetermined distance apart so as to be out of mutual contact engagement when said plates are in lowermost position and so as to come into mutual contact engagement during upward movement of said plates whereby said false bottom will be raised after said plates have been lifted through the predetermined distance.

4. A hydro-extractor including the combination of a basket; a false bottom for said basket; a series of circumferentially spaced vertically

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movable radial dividing plates; a first vertically movable upstanding sleeve member formed integral with said plates; a second vertically movable sleeve member formed integral with said false bottom and extending upwards within said first sleeve member and being concentrically spaced therefrom; vertically movable downwardly released lifting means capable of acting on said first sleeve member at will for raising and lowering said plates; and cooperative engaging portions provided at the interior of said first sleeve member and at the exterior of said second sleeve member, the said engaging portions being relatively vertically spaced a predetermined distance apart so as to be out of mutual contact engagement when said plates are in lowermost position and so as to come into mutual contact engagement during upward movement of said plates whereby said false bottom will be raised after said plates have been lifted through the predetermined distance.

5. A hydro-extractor including the combination of a basket; a false bottom for said basket; a series of circumferentially spaced, movable, radial dividing plates; a first vertically movable upstanding sleeve member having a projection thereon and formed integral with said plates; a second vertically movable sleeve member formed integral with said false bottom and extending upward within said first sleeve member and being concentrically spaced therefrom; vertically movable releasable hook means capable of engaging with the projection on said first sleeve member for raising and lowering said plates; cooperating engaging portions provided at the interior of said first sleeve member and at the exterior of said second sleeve member, the said engaging portions being relatively vertically spaced a predetermined distance apart so as to be out of mutual contact engagement when said plates are in lowermost position and so as to come into mutual contact engagement after upward movement of said plates whereby said false bottom will be raised when said plates have been lifted through the predetermined distance; and an annular ring connecting the outer extremities of the upper edges of the dividing plates to bind the latter in conjunction with said first sleeve member into a rigid structure capable of resisting deformation or bending of the plates during the centrifuging operation.

6. A hydro-extractor including the combination of a basket; a false bottom for said basket; a series of circumferentially spaced vertically movable radial dividing plates; a first vertically movable upstanding sleeve member formed integral with said plates and having a flange at the upper end thereof; a second vertically movable sleeve member formed integral with said false bottom and extending upwards within said first sleeve member and being concentrically spaced therefrom; vertically movable depending hook means on said first sleeve member for raising and lowering said plates and capable of releasably engaging with the flange; mutually cooperative engaging portions secured at the interior of said first sleeve member and at the exterior of said second sleeve member, said engaging portions

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being relatively vertically spaced a predetermined distance apart so as to be out of mutual contact engagement when said plates are in lowermost position and so as to come into mutual contact engagement during upward movement of said plates whereby said false bottom will be raised after said plates have been lifted through the predetermined distance; means for guiding the first sleeve member and the depending hook means in vertical movement; and an annular ring rigidly connecting the outer extremities of the upper edges of the dividing plates to bind the latter in conjunction with said outer sleeve into a rigid structure capable of resisting deformation or bending of the plates during the centrifuging operation.

7. A hydro-extractor comprising in combination a basket; a false bottom for such basket; an inner sleeve extending up centrally from the false bottom; a tubular member fitting slidably within said sleeve; two diametrically opposed longitudinal slots provided in said sleeve; a collar surrounding said tubular member and secured thereto; a pin extending transversely through said collar and said slots of the tubular member; pivotally-mounted hooks depending from said collar; an outer sleeve surrounding and spaced from said inner sleeve; a series of dividing plates carried by said outer sleeve and extending radially outwards from the same and reaching substantially to the wall of the basket; catches provided on the exterior of said outer sleeve for engagement by said depending pivoted hooks upon upward movement of said tubular member; cooperating abutments arranged exteriorly at the upper end of said inner sleeve and interiorly at the lower end of said outer sleeve, the said abutments extending into the same vertical plane; lifting means engaging the said pin so that raising of said pin operates first to raise the dividing plates clear of the material in the basket and thereafter to raise the false bottom on which the material rests; and an annular ring secured to and rigidly interconnecting the outer extremities of the upper edges of said dividing plates to bind the latter in conjunction with said outer sleeve into a rigid structure capable of resisting deformation or bending of the dividing plates during the centrifuging operation.

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