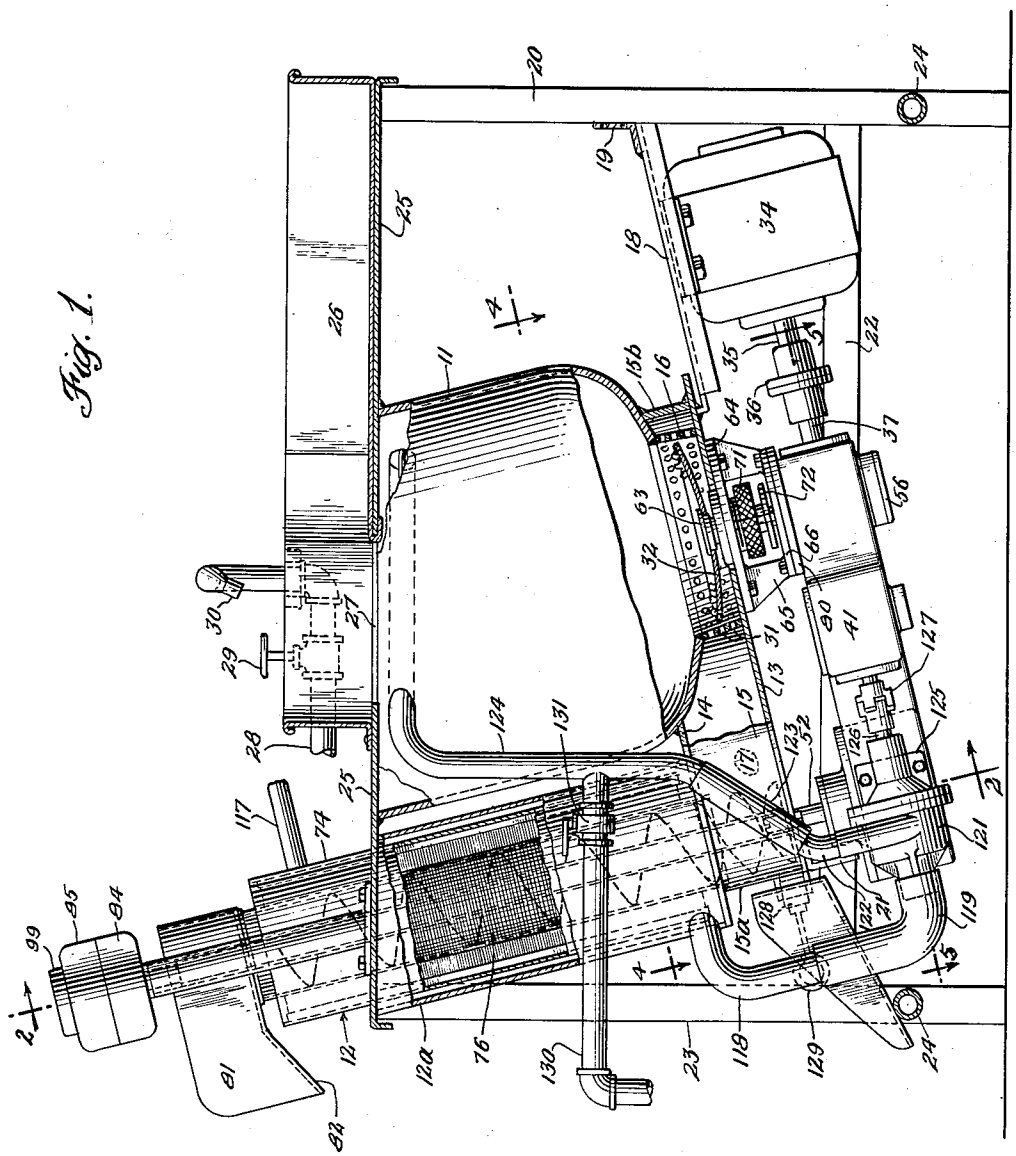
Feb. 7, 1961 W. T. BUCKMAN 2,970,776

WASTE DISINTEGRATING MACHINES

Filed June 27, 1957 4 Sheets-Sheet 1

Fig. 1.



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WASTE DISINTEGRATING MACHINES

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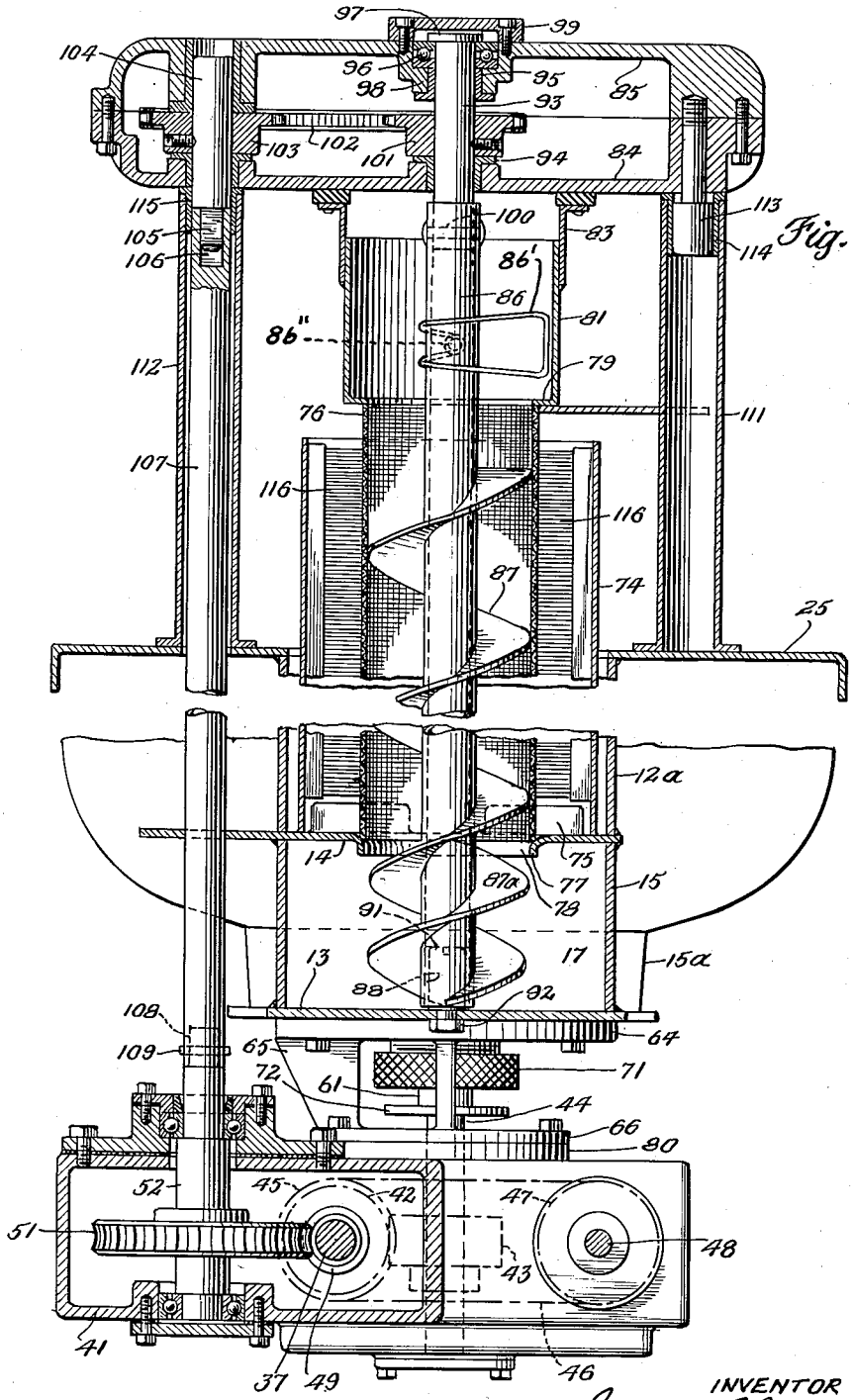


Fig. 2.

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WASTE DISINTEGRATING MACHINES

Filed June 27, 1957 4 Sheets-Sheet 3

Fig. 3.

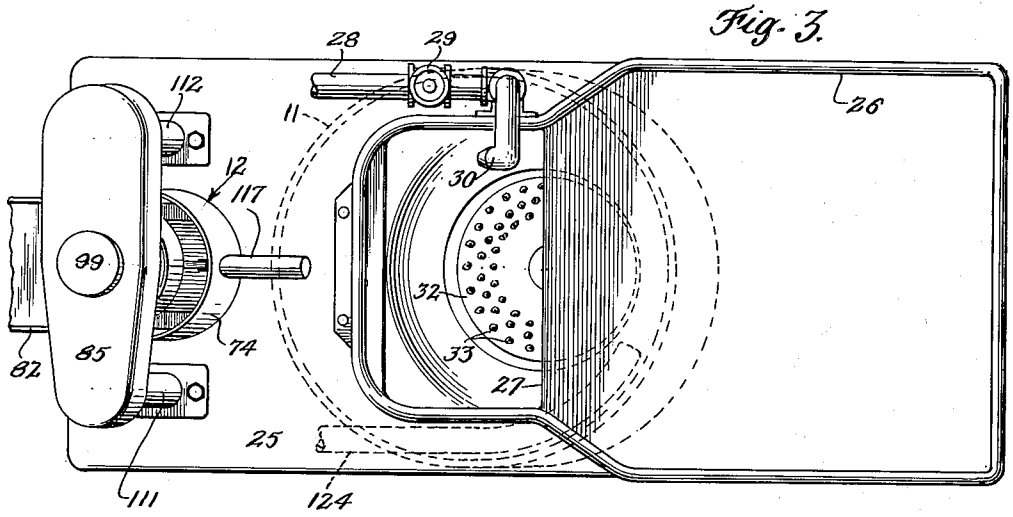


Fig. 4.

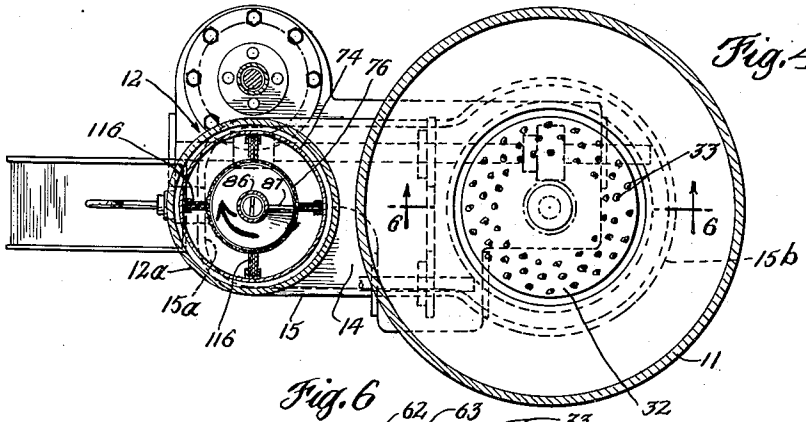


Fig. 6

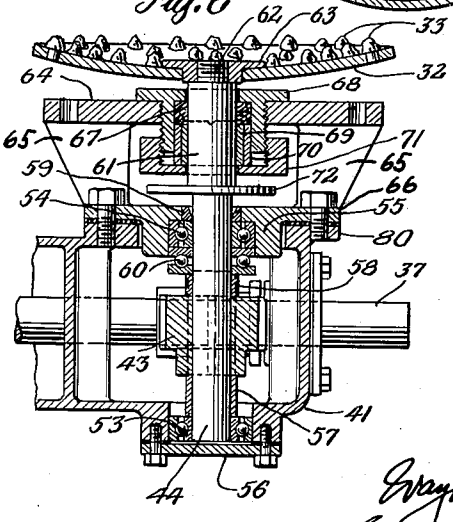
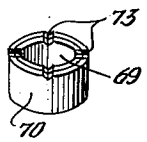


Fig. 7.



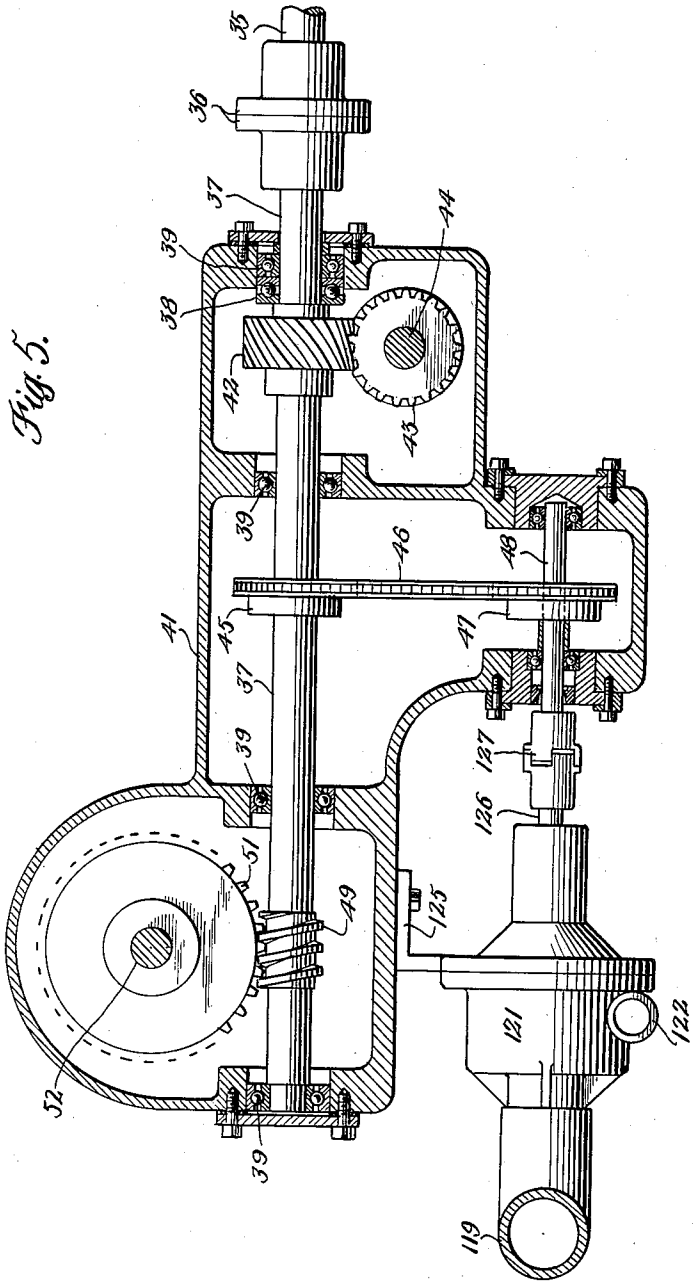
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WASTE DISINTEGRATING MACHINES

Filed June 27, 1957 4 Sheets-Sheet 4

Fig. 5.



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WASTE DISINTEGRATING MACHINES

Wayne T. Buckman, Smithtown, Pa., assignor to Meili & Worthington, Inc., Hatboro, Pa., a corporation of Pennsylvania

Filed June 27, 1957, Ser. No. 668,494

8 Claims. (Cl. 241—46)

This invention relates to waste disintegrating machines, and particularly to a machine adapted for disintegration of wet waste—whether initially wet (as in the case of garbage) or wetted down for the purpose of disintegration (as in the case of waste paper).

More particularly the invention relates to a disintegrating machine of that character, wherein there is a rotatable disintegrating impeller associated with a tub for the wet waste, and having an extractor for receiving wet material from the tub, through an intermediate sieve or the like which is adapted to prevent the passage of larger solids from the tub while permitting the passage of substantially disintegrated solids with the liquid in which they are entrained.

While the invention is useful in such machines where water or other liquid is added to the tub or vat, progressively, as the extractor withdraws the wet material and delivers a partially-dried pulp, it is in its preferred embodiment incorporated in a machine which (though it may have means for adding water to the waste) is provided with a liquid-return or recirculating system, adapted to take liquid progressively from the extractor as the latter separates out the partially-dried pulp, and to return said liquid, as by a pump, to the tub. In such an embodiment, an initial substantial quantity of liquid is delivered into the machine from any suitable source (such as an ordinary water line) and the waste material to be disintegrated is then progressively (either continuously or by batches) fed into the tub of the machine and subjected to the disintegrating process; the extractor being continuously operated (along with the disintegrating impeller) and the major part of the liquid progressively drawn off from the extractor and returned into the tub. In such a machine, a minimum of make-up liquid is consumed, and yet the discharged partially-dried pulp is delivered in large quantities and in a fairly clean and unobjectionable condition.

In such disintegrating machines, the invention contemplates, broadly, improvements and economies in the construction, operation, maintenance and repair of the machine as a whole, and more particularly as to certain portions of the machine, such as the power means, the transmission, the extractor, the mounting of two or more of those elements and the liquid-return pump, relative to each other and to the framing of the machine, and the location, construction and operation of the driving connections between the transmission means on the one hand, and the pump, the impeller and the extractor (and notably the last two) on the other hand.

Still more specifically, the invention contemplates, for a machine of the character described, various coordinated and cooperating features of improvement, such as (but not limited to) the following: the provision of an improved extractor, comprising a substantially self-clearing extractor lifting screw assembly fitted closely within its screen and preferably having more closely spaced flight turns at the lower, i.e. pick-up, end of the extractor (as by being there provided with a multiple screw portion),

and/or having near the top of the central axis member of the screw a dislodging device for the solids; the provision of an extractor assembly with a positioning bearing at its lower end and preferably also with a guiding plate for insertion of the screw, such plate serving also as the bottom plate for the liquid take-off chamber of the extractor; the provision of a transmission or driving connection to the central member of the extractor screw coupled thereto near the upper end thereof whereby to eliminate entirely the customary packings or the like at the bottom of the screw; the provision of a common transmission casing and bearing housing for the upper end of the screw, and preferably also a plurality of supports for said casing, one of which houses a drive-shaft extending upwardly thereto; the provision of a common power means coupled both to the disintegrating impeller and to the extractor screw, so that one of said driven members cannot be inadvertently operated while the other is not operating, and preferably also with a substantial speed difference, as by a gear reduction to the screw, so that their operations will always be coordinated in the proper ratio; the provision of a common transmission for the impeller and extractor drives and also for the liquid return pump which takes liquid from the extractor and returns the same to the tub with which the impeller is associated; the provision of maximum simplicity and minimum maintenance problems in the drive connections from said transmission to said impeller, as by the incorporation of a combined bearing and stuffing box at the point where the drive connection passes through the frame structure; and the disposition of such frame structure below the tub, the impeller and the extractor (on the one hand), and above the motor, the main transmission and the pump (on the other hand).

The invention further contemplates novel subcombinations and novel parts and associations of parts in a machine of the character mentioned, as will further appear from the detailed description of the invention which follows. All of the foregoing will be more apparent from said description, taken together with the accompanying drawings, wherein:

Figure 1 is an elevational view of a disintegrating machine embodying the present invention, with certain parts broken away and certain parts shown in vertical longitudinal section;

Figure 2 is a transverse sectional view, partly broken away, taken on the line 2—2 of Figure 1 but to a larger scale;

Figure 3 is a plan view of the machine of Figure 1;

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Figure 1, and showing particularly certain features of the tub, impeller, extractor and associated parts;

Figure 5 is a similar sectional view taken on the line 5—5 of Figure 1, but to a larger scale, showing particularly the transmission of the machine, and (in elevation) the fluid-return pump;

Figure 6 is a vertical section taken on the line 6—6 of Figure 4, but to a larger scale, and illustrating the drive from the transmission to the impeller, with certain associated parts; and

Figure 7 is a perspective view of a self-lubricating bearing for the impeller drive-shaft, which also forms a part of an adjustable packing assembly for said shaft.

From Figure 1 it may be seen that the machine includes a vat or tub 11 for wet waste, this preferably being cylindrical with its axis at approximately 15° off the vertical. Alongside of this is the extractor assembly, generally designated 12, whose axis also extends upwardly, in substantial parallelism with the axis of the tub. The obliquity to the vertical improves the vortex action in the tub and also the operation of the extractor. At right

angles to these two axes is the bottom floor 13 of what might be called the machinery frame or bed, which also has an upper plate member 14, and an upright wall 15, having curved end portions 15*a* and 15*b*, as best seen in Figure 4. This structure not only ties together physically the vat or tub 11 and the extractor assembly 12, but also serves as a passageway, with a natural gravity slope, from the discharge ring 16 at the bottom of the tub to the intake chamber 17 at the bottom of the extractor assembly.

This machinery bed or framing has at one end an extension 18, rigidly secured by cross-bracing 19 to the upright legs 20 at one end of the machine, and at the opposite end has a brace 21 secured to the gear casing. Frame elements 22 extend between leg members 23 at one end of the machine and to leg members 20 at the other end. The upright legs 20 and 23 are connected together in pairs by cross-braces 24 near the bottom, and at the top by the main top deck 25, to which latter is secured also the top of the tub 11 and the top of the outer enclosure 12*a* for the extractor assembly. The enclosure 12*a* serves as an additional framing element or interbrace between the top deck 25 and the machinery frame-plate 14. Most of the structural interconnections are made by welding, as shown.

The waste is fed to the tub 11 from a tray or trough 26, seated on the top deck 25, and having a discharge opening 27 which extends right through the top deck also, as seen in Figures 1 and 3. Where the waste material is to be delivered to the machine from a distance, a conveyor may obviously be arranged to discharge onto the tray 26.

The liquid to be initially introduced into the tub, and also the make-up liquid which may be required as the machine continues in operation (due to the fact that the solids will be discharged from the extractor in only a partially-dried state) may be introduced into the tub as by a water line 28 having a valve 29 and a discharge spout 30 located above and directed downwardly through the aperture 27.

At the bottom of the tub, or preferably within the confines of the annular discharge screen or sieve 16 (which is perforated with a multiplicity of holes 31 of about 9/32" diameter) is disposed the rotating disintegrating impeller 32, seen in Figs. 1, 3, 4 and 6. This impeller is slightly concave or dished on its upper surface and there carries a multiplicity of sharp or rough carbide protuberances 33, designed to aid in causing a swirling action of the wet mass in the tub and at the same time to break down the solids therein into smaller particles or separate fibers or shreds, depending upon the nature of the material being operated upon. Any sufficiently comminuted solids, resulting from this action of the impeller, pass out with liquid through the holes 31 of the sieve 16, and thence to the chamber 17 at the foot of the elevating screw of the extractor.

It is important that the lifting screw of the extractor should have adequate surface area for pick-up of the sludge-like material in the receiving chamber 17 but that it should not operate too rapidly nor have too great an operating surface in its upper portion. For these combined characteristics, I have found it very advantageous to space the screw flights closer together in the bottom region of the screw, at the zone of pick-up (as by inserting an extra flight element in that region), also to employ a close working fit between the screw and its surrounding screen, and further to employ a substantially lower r.p.m. for the screw than for the disintegrating impeller, the last-mentioned characteristic being obtained (where a high-speed driving motor is used for the impeller) by driving the extractor screw from the same power source and using a reduction gear in the drive to the screw, for example a reduction of 20 to 1. Because of the practical advantages of introducing the waste material and the water at the top of the tub and mounting the disintegrating impeller adjacent the bottom thereof, it is most practical to couple the driving source to the impeller through a transmission located immediately below the latter—a short drive connection being particularly advantageous here because of the high speed of rotation involved—but I have found that it is quite desirable, on the other hand, to couple the drive to the extractor screw adjacent the top of the latter, thereby eliminating the necessity for stuffing boxes and other complications at the lower end of the screw. I accomplish these purposes by locating the gear reduction for the screw in a position beneath the screw—most desirably in the same gear box or transmission housing from which the disintegrating impeller is driven, and then extending the drive upwardly, generally parallel with the extractor screw, to a zone of connection with said screw at the top. In this way I am also enabled to locate the liquid-return pump relatively close to the bottom of the extractor, so that the pump intake line is fed therefrom by gravity, and to mount the pump on the same general transmission housing and drive it from the same transmission as I employ for the impeller and screw.

These general arrangements will now be described, and as the description proceeds it will become apparent how the driving connection is made to the impeller, how the subjacent transmission is protected as against leakage around said driving connection, how the drive is carried upwardly to the top of the screw, and how the screw itself is constructed and supported in its proper relationship with the other parts of the extractor assembly.

Beneath the machinery bed extension 18 is slung the electric motor 34, which, for a machine having a tub 11 of about 18" diameter and 20 gallons capacity may be a motor of 3 H.P. operating at about 1800 r.p.m. These and other figures herein are used by way of example or illustration, and not by way of limitation. The motor-shaft 35 is coupled by a disconnectible coupling 36 (which if found desirable may be of a flexible type) to the main transmission shaft 37, mounted by a thrust bearing assembly 38 and a series of radial bearing assemblies 39 in the several supports, as shown, formed in the transmission housing 41.

It will be observed from Figure 5 that there are three drive take-offs from shaft 37. First there is a helical gear 42 fixed on said shaft and meshing with a similar gear 43 on the upright impeller drive-shaft 44—giving a one-to-one ratio between the motor and the disintegrating impeller. Next there is a sprocket 45 fixed on shaft 37 and adapted through a chain 46 and sprocket 47 to actuate the generally horizontal pump-shaft 48—giving a one-to-one ratio between motor and pump. Finally there is a worm 49 meshing with a worm wheel 51 fixed on a generally upright shaft 52, adapted to give the above-mentioned gear reduction to the drive for the extractor screw, which drive will be described later on.

Returning now to the impeller drive-shaft 44, it will be seen from Figure 6 that this is mounted in lower and upper radial bearings 53, 54 supported respectively by a boss of the bottom wall of the transmission housing 41 and by a boss 55 of the flange 66 forming part of the main transmission supporting bracket 64, 65, 66. The flange 66 also serves as a coverplate for an aperture in the top of the transmission housing 41—suitable gaskets, screws and studs being provided for the said member 66 and the bottom coverplate 56. Positioning sleeves 57, 58, a fluid seal 59, and the thrust bearing 60, complete this part of the assembly.

The upright shaft 44 is carried upwardly with an enlarged portion 61, which at the top has a reduced, threaded end 62, on which the threaded central hub member 63 of the impeller 32 is secured. The shaft portion 61 passes through the heavy seating flange 64 of the bracket structure 65, which, as seen in Figure 1 is secured or bolted by means of bolting flange 64 to the bottom plate 13 of the machinery bed. Said bracket structure (as herein-

before described) also carries a bottom flange 66 which is screwed or bolted to a substantial pad 80 formed on the upper portion of the transmission housing 41. Thus the machinery bed, which is rigidly interconnected with the tub 11 above, is also rigidly interconnected with the transmission housing below.

Where the shaft 61 so passes through the bolting flange 64, an additional bearing serving also as a packing or stuffing box is provided. This is best seen in Figures 1, 6 and 7. As there shown, a yielding compressible packing 67 is held in a packing retainer 68 which is screwed in from the top of plate 64. A packing gland comprising one or more self-lubricating collars 69, 70 (for example of oil impregnated bronze) having a close fit between the shaft portion 61 and the sleeve portion of the retainer 68, is forced up against the packing 67 by means of the take-up ring 71 which is screwed onto the outside of the packing retainer 68. The take-up ring 71 is knurled on the outside, as shown in Fig. 1, or may be provided with bosses, so that it can be readily gripped by hand or by a tool. This portion of the mechanism is completed by a neoprene slinger 72, pressed onto the shaft 44, up against the shoulder formed by the enlarged portion 61 of said shaft. If any liquid should leak down through the combined packing and bearing assembly above described, it will be thrown off by the rotation of the slinger 72, so that there is little likelihood of any moisture following the shaft down into the transmission housing.

As seen in Figure 7, the packing gland rings or collars 69 and 70 are provided with radial grooves 73 into which the packing material 67 will be forced when the adjusting or take-up ring 71 is tightened up. This helps to prevent any of the parts of this assembly from rotating with the shaft, and thus saves excessive heating and wear.

Turning now to the extractor and the actuation thereof, it will be seen from Figures 1 to 4 that within the cylindrical enclosure 12*a*, and extending upwardly above the top thereof, through a registering aperture in the upper deck 25 of the machine, there is housed a tube 74 which rests upon the bed plate 14 and is centered within the housing 12*a*. An inner, foraminous tube or screen 76, having substantial clearance relative to the outer tube 74, is centered therewithin, partly by the guiding and centering flange 77 around the aperture 78 in plate 14, through which the screw assembly passes. The upper end of screen 76 abuts, or may be affixed to, the inturned flange 79 of the shouldered discharge chamber 81 which has a discharge spout 82 at one side. The chamber 81 may be positioned by ears 83 affixed to the bottom half 84 of the drive casing forming part of the head assembly, the upper half of said casing being indicated at 85. This head assembly serves both a positioning and driving function as will later be described.

The lifting screw comprises a central upright shaft or body member 86 (which in this embodiment is of tubular form) and a flight 87 of a size and disposition to fit rather closely within the screen 76. At the foot of the lifting screw there is a self-lubricating bearing sleeve 88 secured within the tube 86 as by a force fit, and within said sleeve is a plug-like positioner 91 extending downwardly and bearing upon the bottom plate 13 of the machinery framing, and there secured by a nut 92, which may be tightened up and/or provided with a gasket to make a leak-proof connection with said plate 13.

In the region between the plate 13 and the plate 14, i.e. within the pick-up chamber 17, additional lifting screw surface is provided, in this embodiment by means of an added flight 87*a*, there shown as being one full turn.

At the head of the lifting screw is a shaft extension 93, secured in the end of screw-shaft 86, as by a brass shear bolt or a rivet 100. This extension has a self-lubricating bearing 94 in the bottom half 84 of the split casing, a similar bearing 95 in the top half 85 of said casing, and a thrust bearing 96 interposed between a fixed head 97 on said shaft and a fixed shoulder 98 on said casing member. A cap 99 completes this portion of the assembly.

On said shaft extension 93 is fixed a sprocket 101, driven through chain 102 from sprocket 103 fixed to a short shaft 104, having bearings in the casing members 84 and 85 similar to the bearings for the shaft member 93. The lower end of the shaft member 104 has a squared portion 105 fitted within the square socket 106 of the upright drive-shaft 107. This shaft at the bottom has a disconnectible telescopic joint 108 with the upper end of extractor drive-shaft 52 located in the lower transmission housing. A shear pin 109 may be included in this assembly. Bearings, gaskets, caps and seals are provided for the shaft element 52 in a manner shown in Figure 2, generally similar to the arrangement shown in Figure 6 for the drive to the impeller.

It should here be noted, as to the upper head structure 84, 85, that it and the associated parts are firmly positioned by a pair of tubes 111 and 112, the latter of which serves also to house the upright drive-shaft 107. A fixed screw plug member 113 is slidably engaged in a sleeve 114 in tube 111. The shafting 104, 107 is similarly slidably engaged with a self-lubricating bearing sleeve 115 in the tube 112.

When the motor 34 is operating, the driving connections above described (extending from the lower transmission housing to the upper extension shaft 93 of the screw) will rotate said screw—clockwise when viewed from above—so that as seen in Figure 2 the screw will lift material from the chamber 17 up through the screen tube 76. On the way up, liquid will drain from the material through said screen, and a partially-dried pulp is delivered to the upper chamber 81 and thence discharged by way of spout 82 into any suitable receptacle or onto a suitable conveyor (not shown). As a certain amount of solids may tend to come through the screen, this may be brushed from time-to-time by means of the brushes 116, fixed to the outer tube 74 which may be given an oscillating rotary motion by means of the handle 117 (Figs. 1 and 3).

The water thus extracted from the material so raised flows off at the bottom of the tube 74, through cutouts 75, and is drained away by the drain-pipe 118 extending through the outer casing 12*a*. This pipe is connected as by a hose 119 to the intake side of a pump 121, located beneath the extractor assembly. This pump may typically be of a capacity of 10 g.p.m. The discharge line 122 of the pump has a hose connection 123 to a return pipe 124 which passes into the tub 11. The pump is mounted by a bracket 125 on one side of the transmission housing 41, and the pump-shaft 126 is connected by readily disconnectible coupling 127 (flexible if desired) to the extension of shaft 48 of the main transmission. This shaft is provided with bearings, sealing means, closure caps, etc. in a manner somewhat similar to shafts 37, 44 and 52 already described.

By this mounting and drive arrangement for the pump, it will be obvious that whenever the impeller and extractor are being driven the pump also will be driven, so that the liquid return from the extractor to the tub will always be assured.

It will be observed that the low point in the system of mixed solids and liquids is at the lower left-hand end of chamber 17 in Fig. 1. In case any hard objects pass thereinto, they may be removed by means of a screw plug 128, the handle of which is shown at 129. The outlet at plug 128 may also be used to drain off the liquid from the tub 11, the chamber 17 and the interconnecting passage.

In any instance where it is desired to replenish extracted liquids partially or entirely with fresh liquid, (for example, as delivered by pipe 30), the pump, in-

stead of delivering solely into tub 11 by pipe 124, may be permitted to pump all or part of the liquid from the extractor out through a drain pipe 130 controlled by a valve 131. By adjusting the supply valve 29 and the drain valve 131, a proper balance of liquids and solids in the tub may be maintained, and foaming may be reduced or prevented.

In case the material lifted by the extractor screw is rather dry and tends to pack within the screen tube 76, added protection to the mechanism and to the motor may be provided by forming the connection 100 (between the screw-shaft 86 and the shaft extension 93) as a shear pin, designed to prevent excessive overload of any other part.

I have found, by considerable experimental operation under actual field conditions that the successful operation of the whole machine depends a great deal upon proper operation of the extractor. In addition to the special features of the extractor screw form, closeness of fit in the screen, relative r.p.m. of screw and impeller and pump, and other interrelationships hereinabove set forth, that it is also quite important to prevent congestion of solids in the discharge head 81 at the top of the screw, and for this purpose I apply a U-shaped wire wiper 86' to the screw shaft 86 at that region, which has proven very effective and is not apt to cause injury to the operator. This device is readily applied by means of a single screw 86'', with which the looped inner end of the device is always held tightly in place, because of the direction of rotation of the shaft, as shown by the arrow in Fig. 4.

From the foregoing description, it will now appear that my improved disintegrating machine is of a very simple, rugged and reliable nature. It has the advantages of prior known machines in this general field, together with a number of other advantages, having to do chiefly with the form, construction, and operation of the main transmission, the extractor, the supporting structure and drive connections for the latter, the combined bearing and sealing assembly for the impeller and the inter-relationship between all of the foregoing and other parts of the machine.

By way of example only, as compared with certain previously known machines in this general field, the present invention eliminates one or more motors heretofore employed, and provides a greatly improved extractor operation with less likelihood of motor overload. Several driving belts have been eliminated, stuffing boxes have been eliminated from the critical location of the extractor, no pillar blocks are needed for the impeller shaft, and the stuffing box and bearing arrangement for the impeller has been simplified and made more reliable; a rugged inter-relationship between the disintegrating assembly, the extractor assembly and the power and transmission assembly has been secured; and servicing has been greatly facilitated and improved by virtue of the ease with which various parts can be removed for repair or substitution, notable examples being the individual removability of the motor, the impeller assembly, the main transmission, the pump, the extractor screw with its upper driving and supporting casing, the extractor trough and screen assembly, the extractor outer tube and brush assembly, etc. Servicing of machines in hotel or restaurant kitchens and other busy and congested places is greatly facilitated, since it is only necessary to remove a worn or damaged part or assembly and quickly mount a replacement therefor, whereupon the worn or damaged part or assembly may be taken to the shop or factory for repairs, without shutting down the operation of the machine during the making of such repairs. Still other advantages will doubtless occur to those skilled in the art.

I claim:

1. In a machine of the character described, having a tub for wet waste, an extractor, comprising a foraminous tube extending upwardly, having a feed connection near its bottom to receive wet material from said tub and adapted to deliver a partially-dried pulp, a lifting screw in said tube comprising a central cylindrical member and a peripheral flight closely fitting said tube, additional flights at the bottom of said screw forming means to facilitate pick-up of material; and wiper mechanism adjacent the top of said member and connected to be rotated with said screw and forming means to facilitate discharge of solids, the said screw being substantially self-clearing by virtue of one or more of the features of its close fit, its pick-up facilitating means and its discharge-facilitating means.

2. In a machine of the character described, having a tub for wet waste, an extractor, comprising a foraminous tube extending upwardly, having a feed connection near its bottom to receive wet material from said tub and adapted to deliver a partially-dried pulp, a lifting screw in said tube comprising a central cylindrical member and a peripheral flight closely fitting said tube, means at the bottom of said screw to facilitate pick-up of material, means at the top of said member to facilitate discharge of solids; the said screw being substantially self-clearing by virtue of one or more of the features of its close fit, its pick-up-facilitating means and its discharge-facilitating means, and a rotatable disintegrating impeller associated with the tub, a common power device for actuating said impeller and said screw, and transmission means between said device on the one hand and said impeller and screw on the other hand and including means providing for driving said screw at a lesser r.p.m. than that of said impeller.

3. In a machine of the character described, having a tub for wet waste, an extractor, comprising a foraminous tube extending upwardly, having a feed connection near its bottom to receive wet material from said tub and adapted to deliver a partially-dried pulp, a lifting screw in said tube comprising a central cylindrical member and a peripheral flight closely fitting said tube, means at the bottom of said screw to facilitate pick-up of material and means at the top of said member to facilitate discharge of solids, the said screw being substantially self-clearing by virtue of one or more of the features of its close fit, its pick-up-facilitating means and its discharge-facilitating means, a rotatable disintegrating impeller associated with the tub, a common power device for actuating said impeller and said screw, transmission means between said device on the one hand and said impeller and screw on the other hand and including means providing for driving said screw at a lesser r.p.m. than that of said impeller and a circulating pump taking liquid from the extractor and returning it to the tub, and said transmission means including a drive connection to said pump configured to rotate the same at an r.p.m. substantially greater than that of said screw.

4. In a machine of the character described, an extractor assembly comprising a generally upright outer tube, an inner, cylindrical foraminous tube, with a clearance space between said tubes for collection and discharge of liquid, a lifting screw closely fitting within said inner tube and having a central upright member with an associated peripheral flight, a positioning bearing at the bottom of said central member, and radial and thrust bearing means adjacent the upper end of said member, drive means at the said upper end of said central member, a transmission casing located around said upper end, spaced-apart upright supports for said casing and a drive-shaft extending upwardly through one of said supports and carrying a transmission element within said casing, said casing and associated parts having slip connections with the supports whereby the casing and screw and the transmission parts within said casing may be lifted up as a unit out of the machine.

5. The construction of claim 4 wherein the outer ex-

tractor tube is disposed between said spaced-apart supports.

6. In a machine of the character described, a tub for receiving wet waste, a rotatable disintegrating impeller disposed in said tub, the rotational axis of the impeller being tilted to the vertical, discharge means on the tub adjacent said impeller, an extractor assembly extending upwardly and having a rotary lifting screw for extracting liquid and delivering pulp, the rotational axis of the lifting screw being generally parallel said impeller axis, intake means adjacent the bottom of said screw, a transfer passage between said discharge means and said intake means, the passage being inclined to the vertical to provide a gravity feed as between the discharge means and the intake means and means coordinating the rotational speeds of said disintegrating impeller and said lifting screw.

7. In a machine of the character described, a tub for receiving wet waste, a rotatable disintegrating impeller disposed in said tub, the rotational axis of the impeller being tilted to the vertical, discharge means on the tub adjacent said impeller, an extractor assembly extending upwardly and having a rotary lifting screw for extracting liquid and delivering pulp, the rotational axis of the lifting screw being generally parallel said impeller axis, intake means adjacent the bottom of said screw, a transfer passage between said discharge means and said intake means, the passage being inclined to the vertical to provide a gravity feed as between the discharge means and the intake means, and framing common to said tub, said impeller, said transfer passage and said extractor assembly, and common drive means for said lifting screw

and said impeller mounted on the framing and having a driving connection at the top of said screw.

8. In a machine of the character described, an extractor assembly comprising a generally upright outer tube, intake means at the bottom of said outer tube an inner, cylindrical foraminous tube, with a clearance space between said tubes for collection and discharge of liquid, a lifting screw closely fitting within said inner tube and having a central upright member with an associated peripheral flight, the screw extending into said intake means and the spacing of the flight turns in the intake area being closer than the spacing of the flight turns in said inner tube, a rotatable drive shaft extending upwardly generally parallel said member, means connected between said drive shaft and said member adjacent the respective tops thereof for rotating the member in accordance with the rotation of the shaft, and means connected adjacent the bottom of said shaft for rotating the same.

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