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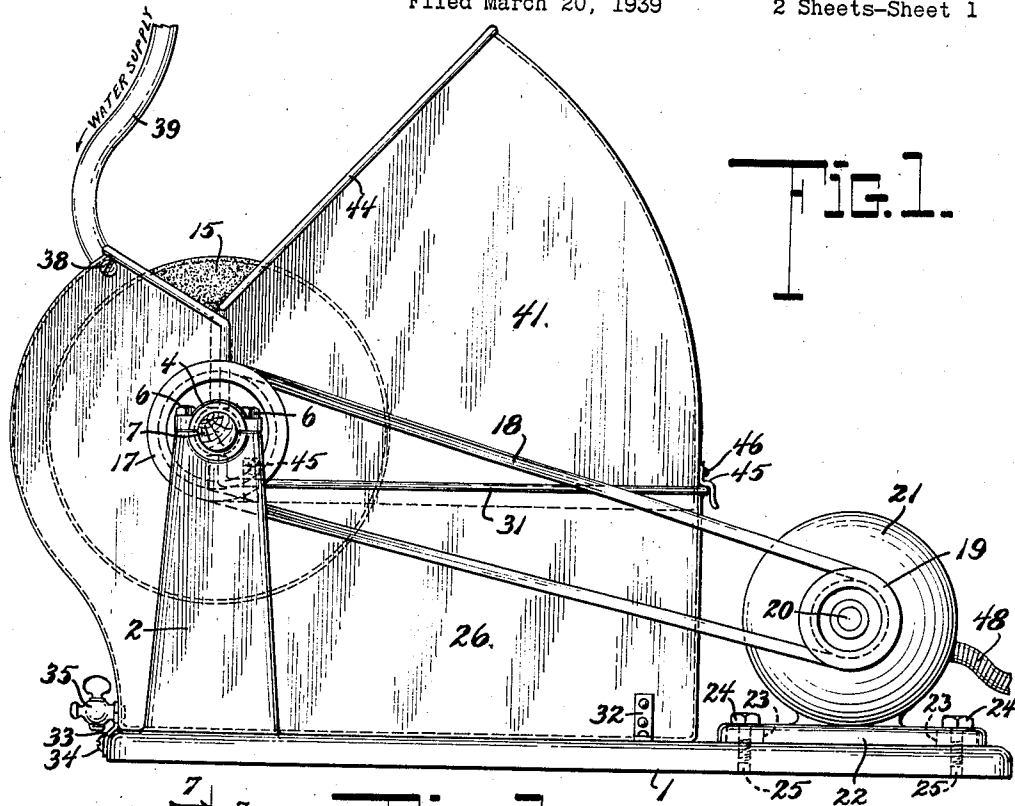
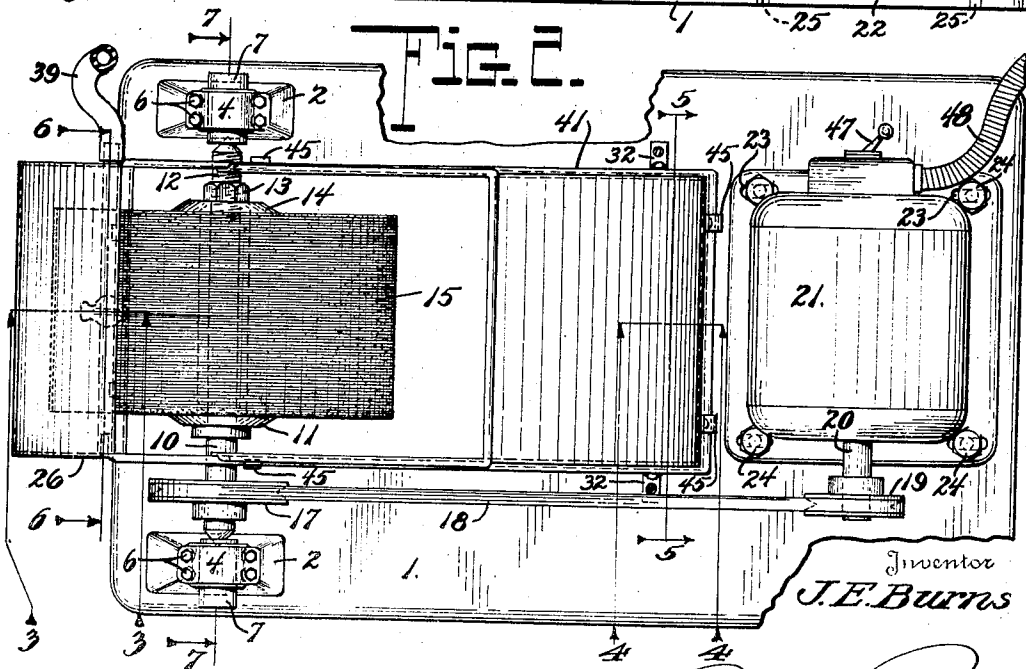
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2,228,386

ABRADING APPARATUS AND THE LIKE

Filed March 20, 1939

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

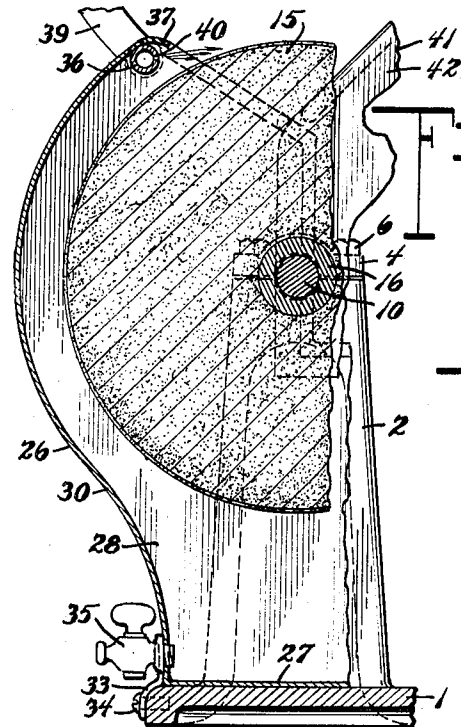


Fig. 3.

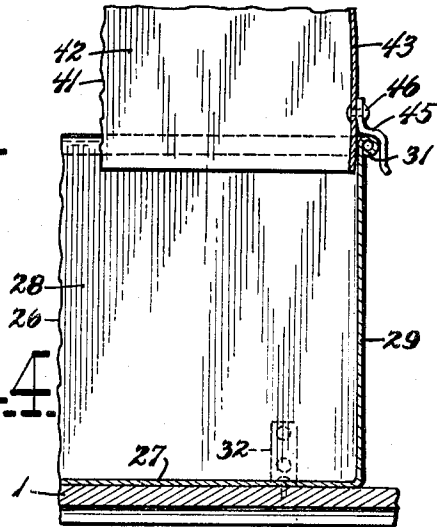


Fig. 4.

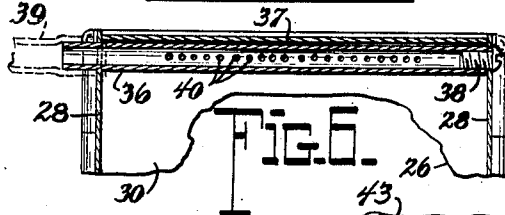
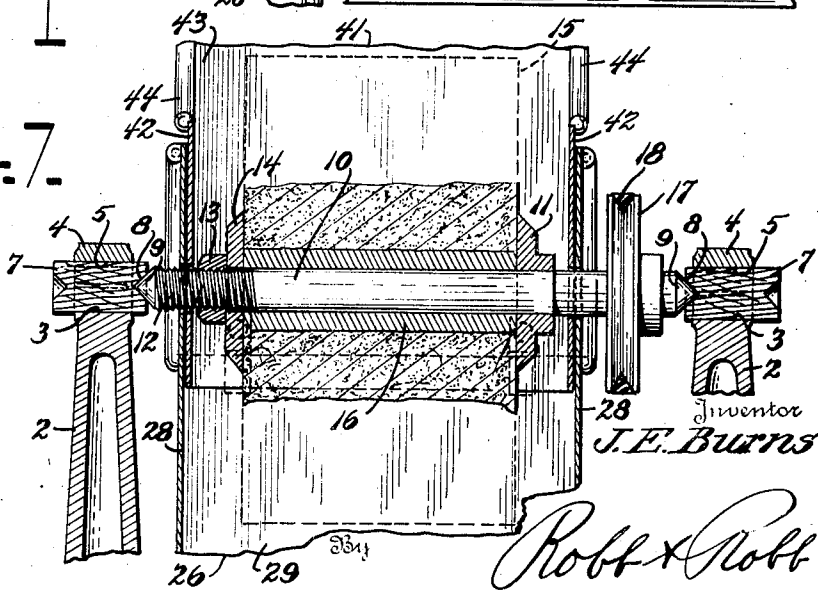


Fig. 5.

Fig. 6.



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## UNITED STATES PATENT OFFICE

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## ABRADING APPARATUS AND THE LIKE

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Application March 20, 1939, Serial No. 262,996

5 Claims. (Cl. 51—267)

This invention appertains to apparatus for grinding or sharpening edged tools, implements, and the like, and more especially to apparatus for forming serrated edges on the same.

Among the principal objects of the invention, it has been my aim to provide a compact, relatively simple and inexpensive, portable apparatus which will efficiently perform the desired grinding operation.

To the above end, my apparatus is generally composed of a base, upon which a rotary abrasive element is mounted, the base carrying a motor operatively connected with the rotary element to drive the same, and the assembly of the parts being of such a character as to constitute a rigid and durable unit which is endowed with long life and which will not readily get out of order.

A further object of the invention is to provide an improved and novel form of housing for the rotary abrasive element, the housing serving in part as a tank for catching the water or other fluid medium which is generally used in connection with grinding apparatus of this character, and the tank also having an easily removable hood which cooperates with the tank to substantially enclose the rotary abrasive element, thus preventing the liquid medium, abrasive and metallic particles from being thrown off into the air in the vicinity of the apparatus.

As a further object of the invention, the tank and removable hood above referred to are so constructed as to insure a maximum degree of safety in the operation of the apparatus.

Still another object of the invention is to provide an improved fluid distributing means by which water or an equivalent fluid medium may be effectively directed onto the rotary abrasive element while the same is in use to perform the grinding operation.

Other and further objects of the invention will be hereinafter described, and the novel features thereof defined by the appended claims.

In the drawings:

Figure 1 is a view in side elevation of an apparatus embodying the essential features of my invention;

Figure 2 is a top plan view of the apparatus shown in Figure 1;

Figures 3, 4, 5, 6 and 7 are fragmentary sectional views taken approximately in the planes of the lines 3—3, 4—4, 5—5, 6—6 and 7—7, respectively, of Figure 2.

Like reference characters designate corresponding parts in the several figures of the drawings, wherein 1 denotes a base which is preferably

formed of metal for the sake of rigidity, and to impart substantial weight to the base for the purpose of minimizing vibration, distortion, and misalignment of the elements carried thereby, as hereinafter referred to. Near one end of the base and extending outwardly therefrom, is a pair of standards 2, 2 which may be formed integrally with the base 1, as by casting the base and standards in one piece. The upper ends of the standards 2, 2 are each provided with a semi-circular recess 3, and secured to the upper extremity of each standard is a cap 4, also having a semi-circular recess or seat 5 therein. The caps 4, 4 are removably secured to their respective standards 2, 2 by any suitable fastening means such as bolts 6. The semi-circular recesses 3 and 5 together form a circular seat for receiving and clamping the cylindrical wooden bearing members 7, 7, each of these bearing members having a conical recess 8 in its inner extremity for receiving the tapered or pointed ends 9, 9 of a spindle 10. The spindle 10 is thus rotatably mounted between the opposed bearing members 7, 7, which are axially adjustable in their seats when the cap bolts 6 are loosened, to take up wear. The members 7, 7 are preferably made of hard wood to minimize wear, and at the same time minimize friction resisting rotation of the spindle 10. Such a construction is quite simple and inexpensive, yet highly efficient and perfectly suited for the purposes intended.

The spindle 10 is provided near one end with an abutment flange 11 which may be integrally formed therewith or otherwise separately formed and fixed thereto, and the opposite end of the spindle is threaded, as at 12, to receive a clamping nut 13 which abuts against a disc 14 which is slidable on the spindle. Disposed intermediate the flange 11 and the disc 14, is an abrasive wheel generally designated 15, the same having a central opening lined with Babbitt metal 16 or other relatively soft material. In mounting the abrasive wheel 15 on the spindle 10, the nut 13 and disc 14 are removed so that the spindle may be inserted through the central opening in the wheel until the abutment flange 11 engages one side of the wheel. Thereafter, the disc 14 is applied onto the spindle and moved into abutting engagement with the opposite side of the wheel, and the nut 13 is screwed onto the threaded end 12 of the spindle to impart a clamping pressure to the disc 14 and thereby firmly secure the abrasive wheel 15 to the spindle 10.

A pulley 17 is fixedly mounted near one end of the spindle 10 and is operatively connected by a

belt 18 to a driving pulley 19 fixedly mounted on the drive shaft 20 of an electric motor 21. The motor 21 is secured to the base 1 in any suitable manner, provision being made for adjusting the motor relatively to the abrasive wheel 15 so that the proper tension can be imparted to the belt 18 and wear of the belt can be compensated to prevent slippage of the belt. As a convenient form of adjustable mounting for the motor 21, the motor base 22 may be slotted, as at 23, and bolts 24 passed through said slots and threadedly received in openings 25 formed in the base 1. The slots 23 thus allow a reasonable range of adjustment of the motor 21 on the base 1 when the bolts 24 are loosened.

The abrasive wheel 15 may be constructed of any suitable material and is preferably composed of what is known in the trade as a whetstone mixture. When used to grind serrations in edged tools, the periphery of the wheel 15 is formed with grooves to provide alternate, circumferential, V-shaped grooves and ridges transversely across the peripheral face of the same. Of course, an abrasive wheel having a smooth or plain peripheral face may be used for the purpose of performing an ordinary grinding or sharpening operation. In either case, the width of the abrasive wheel is preferably approximately equal to the length of the edge of the tool or implement which is to be sharpened or serrated, as the case may be. However, this is not essential, as narrower abrasive wheels may be employed if preferred, so that instead of acting upon the entire edge in one operation, the edge of the tool or implement may be sharpened or serrated in successive stages.

Mounted upon the base 1 is a tank 26 of elongated, generally rectangular form, the tank being preferably made of sheet metal and including a bottom 27, laterally spaced side walls 28, 28 and end walls 29, 30. The end wall 30 extends upwardly from the end of the base 1 opposite to the motor supporting end, and is curved so as to be disposed relatively close to the periphery of the abrasive wheel 15, as will be best understood from reference to Figures 1 and 3. The upper extremity of the end wall 30 terminates about on a level with the uppermost side of the abrasive wheel so that it extends a substantial distance around the periphery of the wheel. The side walls 28, 28 are of substantially uniform height from the end wall 29 to about the vertical center of the abrasive wheel 15, with the upper edges disposed somewhat below the horizontal center of the wheel. At about the vertical center of the abrasive wheel 15, the side walls 28, 28 are vertically extended upwardly to correspond with the height of the curved end wall 30, but with their upper extremities inclined downwardly from the upper edge of the end wall 30, as clearly shown in Figures 1 and 3. The free edges of the side walls 28, 28 and the end wall 29 are preferably rolled over in an outward direction, as indicated at 31, to provide a bead, which serves to stiffen the tank walls and also to minimize the danger of injuring the operator through bodily contact with the edges of the tank. The tank 26 is fixedly secured to the base 1 in any convenient manner, as by means of a pair of angle brackets 32, each having one arm attached to one of the side walls 28 near the motor end of the tank, and the other arm attached to the base 1, as shown in the drawings. The opposite or curved end of the tank is fastened to the base 1 by means of a pair of spaced straps 33 having their upper extremities secured to the end wall 30 and their

lower extremities secured to the edge of the base 1, as by means of screws 34.

Mounted on the end wall 30 near the bottom of the same, and communicating with the interior of the tank 26, is a draincock 35 by means of which liquid in the tank may be conveniently drained off from time to time, as desired.

In the use of the apparatus for performing a tool grinding, sharpening or serrating operation, a liquid, such as water, is preferably sprayed upon the abrasive wheel 15. To this end, there is provided a spray tube 36 disposed transversely between the side walls 28, 28 of the tank 26, just below the lip or upper extremity 37 of the curved end wall 30, the lip 37 being preferably turned inwardly, as shown in Figure 3, so that its extreme edge will not be presented in a position which would interfere with the free manipulation of the tool or implement while held in the hands of the operator. As clearly shown in Figures 1, 2, 3 and 6, the spray tube 36 is disposed with one end in abutting engagement with the inner face of one of the upwardly extended side walls 28 of the tank 26, and is attached to the wall by means of a screw 38 which is inserted through an aperture in the tank wall and threadedly engaged with the interior of the spray tube. The opposite end of the spray tube is extended through an aperture in the opposite upwardly extended tank wall 28 so that it projects somewhat beyond the outer face of the latter, and a flexible hose 39 or other suitable conduit is operatively connected to the outer extremity of the spray tube. The hose or conduit 39 may be readily attached to any convenient source of water supply so that the water will be directed into the spray tube 36 and projected from the latter through perforations 40 arranged at spaced intervals along the spray tube at the side which is nearest to the abrasive wheel 15. The perforations 40 are preferably arranged in such positions that the water will be sprayed onto the abrasive wheel 15 substantially tangential to the periphery of the latter, as indicated by the arrows in Figure 3, thus minimizing splashing of the water through impact against the periphery of the abrasive wheel.

Mounted upon the upper extremity of the tank 26 and cooperating with the upwardly extended side walls 28, 28 and end wall 30, is a removable hood 41, which is also preferably made of sheet metal. The hood includes spaced side walls 42, 42 and a curved end wall 43, with the walls all extended upwardly for a substantial distance above the rotary abrasive element 15. The upper edges of the side walls 42, 42 are downwardly inclined from the upper edge of the curved wall 43, as clearly shown in Figures 1 and 2, and the upper edges of the side walls 42, 42 and the curved wall 43 are preferably rolled over in an outward direction to form a bead 44 to stiffen the same and to eliminate any sharp edges on the hood which might accidentally cause injury to the operator of the apparatus. With the hood 41 mounted on the tank 26, as shown in Figures 1 and 2, the inclined upper edges of the hood meet the inclined upper edges of the extended tank walls at an angle of about ninety degrees, more or less, thereby exposing a portion of the peripheral surface of the abrasive wheel 15 at the upper side thereof for engagement with the tool or implement to be operated upon. The remainder of the abrasive wheel 15 excepting for the operating surface above referred to, is completely enclosed within the tank and hood, thereby insuring a maximum degree of safety in the operation of the apparatus and

preventing the water, and abrasive and metal particles, from being thrown off into the air at a distance from the apparatus pursuant to rotation of the abrasive wheel.

5 The walls of the hood 41 are preferably so arranged that they overlap slightly upon the contiguous walls of the tank 26, at the inner sides of the tank walls, as will be best understood from reference to Figures 1, 3, 4, 5 and 7. To support  
10 the hood in its properly mounted position upon the tank 26, a plurality of brackets 45 are secured to the lower extremities of the hood walls, there being preferably one bracket on each of the side walls 42, 42 adjacent to the ends nearest the  
15 abrasive wheel 15, which shall hereinafter be referred to as the front or forward end, and a pair of spaced brackets are secured to the rear wall 43. The brackets 45 may each be of identical construction, with their lowermost free extremities  
20 disposed in outwardly spaced relation to the walls to which the same are fixed by means of rivets 46 or other equivalent fastening instrumentalities. Due to the spacing of the brackets 45 respecting the hood walls, the roll or beaded upper  
25 edges 31 of the tank 26 may be readily received in the brackets, as clearly shown in Figure 4, as the hood is set onto the tank.

In applying the hood onto the tank, the forward end of the hood is first introduced between the  
30 upwardly extended side walls 28, 28 of the tank 26, with the forwardly disposed brackets 45 engaged over the upper beaded edge of that portion of the tank which is of substantially uniform height, and the hood is then moved forwardly  
35 until its rear wall 43 is disposed slightly forwardly of the rear tank wall 29. Thereupon, the rear end of the hood may be moved downwardly for a short distance within the tank until the brackets 45 on the wall of the hood abut against the  
40 upper edge of the rear tank wall 29. It will be understood, of course, that the forward edges of the side walls 42, 42 of the hood 41 are notched to afford clearance around the spindle 10, and likewise, the rear edges of the extended portions  
45 of the side walls 28, 28 of the tank 26 are notched so as not to interfere with the rotation of the spindle which carries the abrasive wheel 15. The arrangement of these notches will be best understood from reference to Figures 1, 3 and 7.

50 By virtue of the removable assembly of the hood 41 and tank 46, the hood may be quickly and conveniently lifted off the tank to afford access to the latter for purposes of cleaning, and also to enable the abrasive wheel 15 and its spindle 10 to be conveniently removed for interchanging  
55 abrasive wheels. The same spindle 10 may be utilized for different abrasive wheels, if desired, having in mind the removable nature of the mounting of the abrasive wheel 15 on the spindle  
60 10, as hereinbefore described.

In the use of the apparatus, the tool or implement is held by the operator in an obvious manner with its edge pressed against the operative peripheral surface of the abrasive wheel 15, which  
65 is exposed by the inclinations of the upper edges of the tank and hood walls. The operative or working surface of the abrasive wheel is so disposed as to be conveniently accessible to the operator while stationed at the forward end of the  
70 machine, which is to say, the left-hand end as viewed in Figures 1 and 2 of the drawings. During the sharpening or serrating operations, the water directed onto the abrasive wheel 15 by means of the spray tube 36 serves to keep the tool  
75 or implement cool, and otherwise aids in main-

taining a highly efficient operation. While the apparatus is primarily intended for use in sharpening or serrating such edged tools as scissors, knives, and various other forms of cutlery, shear plates or blades of many sorts, it is to be understood that there is no intention of limiting the use thereof solely to this field. It will be obvious that  
5 buffing wheels, sanding elements and other similar instrumentalities may be substituted for the abrasive wheel 15 hereinbefore described, as the occasion requires or demands, so that the apparatus may be said to constitute a multipurpose or  
10 universal unit. As shown in Figure 2, the motor 21 is preferably provided with a control switch 47 for enabling the same to be started and stopped at will. Due to the compactness of the unit, the same is readily portable, and can be conveniently  
15 placed upon any small table or work bench which is available to support the same while in use. When the base 1 and standards 2, 2 are made of cast iron or other metal, the apparatus will be sufficiently rigid and of such weight as to require  
20 no anchoring means to maintain the same stationary while in operation. By connecting the motor 21 to any convenient electrical outlet  
25 through means of the conductor cable 48, the apparatus is immediately conditioned for operation.

While the specific details have been herein shown and described, the invention is not confined thereto, as changes and alterations may be made without departing from the spirit thereof as defined in the appended claims.

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

35 1. Apparatus of the class described, comprising a base, a pair of spaced standards carried by said base and extending upwardly therefrom, a rotary element rotatably supported between said standards, motor means mounted on said base  
40 and operatively connected to said rotary element for driving the same, and a housing substantially enclosing said rotary element, said housing including a tank mounted on said base and extending  
45 between said standards partly around the rotary element, said tank comprising a bottom, an end wall disposed at a substantial distance from the rotary element, spaced walls adjoining said end wall and extending therefrom at a substantially  
50 uniform height below the axis of the rotary element to about the vertical center of the rotary element and extending upwardly a substantial distance above the axis of the rotary element from the vertical center to the end of the base, with the upper edges of the extended side  
55 walls disposed at an inclination to the horizontal, and another end wall adjoining the bottom and the upwardly extended edges of the side walls and curved about the periphery of the rotary element in close proximity thereto, and a hood removably  
60 mounted on said tank and also extending partly around the rotary element.

2. Apparatus of the class described, comprising a base, a pair of spaced standards carried by said base and extending upwardly therefrom, a rotary  
65 element rotatably supported between said standards, motor means mounted on said base and operatively connected to said rotary element for driving the same, and a housing substantially enclosing said rotary element, said housing including a  
70 tank mounted on said base and extending between said standards partly around the rotary element, said tank comprising a bottom, an end wall disposed at a substantial distance from the rotary element, spaced walls adjoining said end wall and  
75

extending therefrom at a substantially uniform height below the axis of the rotary element to about the vertical center of the rotary element and extending upwardly a substantial distance above the axis of the rotary element from the vertical center to the end of the base, with the upper edges of the extended side walls disposed at an inclination to the horizontal, and another end wall adjoining the bottom and the upwardly extended edges of the side walls and curved about the periphery of the rotary element in close proximity thereto, and a hood removably mounted on said tank and also extending partly around the rotary element, said hood comprising spaced side walls adapted to be disposed above the portions of the side walls of the tank which are of substantially uniform height, with the lower extremities of the hood side walls slightly overlapped upon the inner faces of the tank side walls, the upper edges of the hood side walls being inclined from a point below the uppermost side of the rotary element to a point substantially above the rotary element, and a rear wall adjoining the hood side walls with its lowermost edge adapted to be slightly overlapped upon the inner face of the end wall of the tank which is remote from the rotary element, said end wall of the hood curving upwardly above the tank towards the upper extremities of the hood side walls.

3. Apparatus of the class described, comprising a base, a pair of spaced standards carried by said base and extending upwardly therefrom, a rotary element rotatably supported between said standards, motor means mounted on said base and operatively connected to said rotary element for driving the same, and a housing substantially enclosing said rotary element, said housing including a tank mounted on said base and extending between said standards partly around the rotary element, said tank comprising a bottom, an end wall disposed at a substantial distance from the rotary element, spaced walls adjoining said end wall and extending therefrom at a substantially uniform height below the axis of the rotary element to about the vertical center of the rotary element and extending upwardly a substantial distance above the axis of the rotary element from the vertical center to the end of the base, with the upper edges of the extended side walls disposed at an inclination to the horizontal, and another end wall adjoining the bottom and the upwardly extended edges of the side walls and curved about the periphery of the rotary element in close proximity thereto, and a hood removably mounted on said tank and also extending partly around the rotary element, said hood comprising spaced side walls adapted to be disposed above the portions of the side walls of the tank which are of substantially uniform height, with the lower extremities of the hood side walls slightly overlapped upon the inner faces of the tank side walls, the upper edges of the hood side walls being inclined from a point below the uppermost side of the rotary element to a point substantially above the rotary element, and a rear wall adjoining the hood side walls with its lowermost edge adapted to be slightly overlapped upon the inner face of the end wall of the tank which is remote from the rotary element, said end wall of the hood curving upwardly above the tank towards the upper extremities of the hood side walls, and the upper edges of the tank

and hood being formed with beads to stiffen the same.

4. Apparatus of the class described, comprising a base, a pair of spaced standards carried by said base and extending upwardly therefrom, a rotary element rotatably supported between said standards, motor means mounted on said base and operatively connected to said rotary element for driving the same, and a housing substantially enclosing said rotary element, said housing including a tank mounted on said base and extending between said standards partly around the rotary element, said tank comprising a bottom, an end wall disposed at a substantial distance from the rotary element, spaced walls adjoining said end wall and extending therefrom at a substantially uniform height below the axis of the rotary element to about the vertical center of the rotary element and extending upwardly a substantial distance above the axis of the rotary element from the vertical center to the end of the base, with the upper edges of the extended side walls disposed at an inclination to the horizontal, and another end wall adjoining the bottom and the upwardly extended edges of the side walls and curved about the periphery of the rotary element in close proximity thereto, a hood removably mounted on said tank and also extending partly around the rotary element, and a perforated spray tube disposed transversely between the upper extremities of the upwardly extended portions of the tank side walls at the inner side of and below the upper edge of the curved end wall.

5. Apparatus of the class described, comprising a base, a pair of spaced standards carried by said base and extending upwardly therefrom, a rotary element rotatably supported between said standards, motor means mounted on said base and operatively connected to said rotary element for driving the same, and a housing substantially enclosing said rotary element, said housing including a tank mounted on said base and extending between said standards partly around the rotary element, said tank comprising a bottom, an end wall disposed at a substantial distance from the rotary element, spaced walls adjoining said end wall and extending therefrom at a substantially uniform height below the axis of the rotary element to about the vertical center of the rotary element and extending upwardly a substantial distance above the axis of the rotary element from the vertical center to the end of the base, with the upper edges of the extended side walls disposed at an inclination to the horizontal, and another end wall adjoining the bottom and the upwardly extended edges of the side walls and curved about the periphery of the rotary element in close proximity thereto, a hood removably mounted on said tank and also extending partly around the rotary element, and a perforated spray tube disposed transversely between the upper extremities of the upwardly extended portions of the tank side walls at the inner side of and below the upper edge of the curved end wall, fastening means extended through one of the side walls of the tank into the contiguous end of the spray tube, and the opposite end of the spray tube being extended through the opposite side wall of the tank and adapted to be connected to a source of liquid supply.

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