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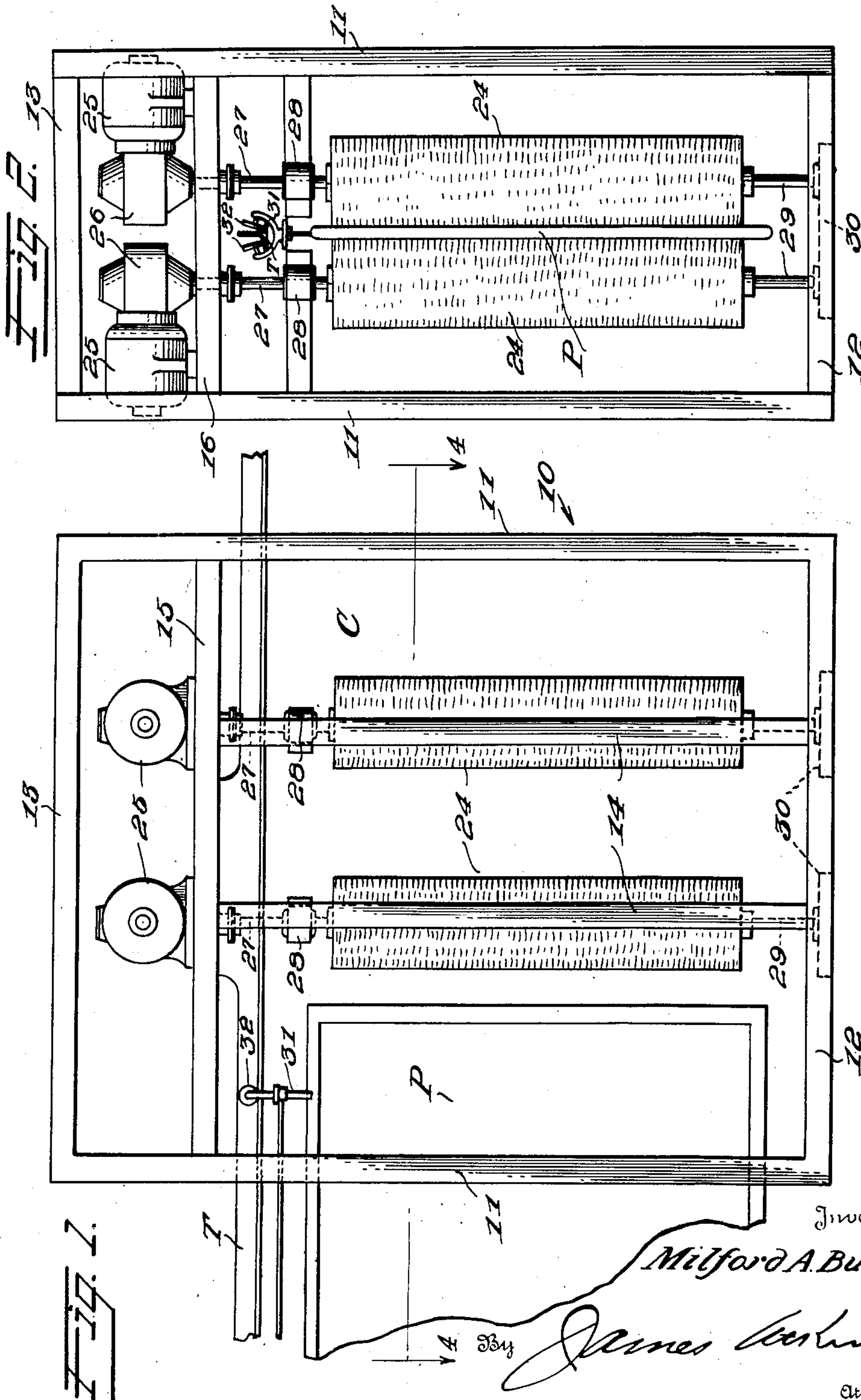
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2,343,532

SCRUBBING OR CLEANING MACHINE

Filed July 4, 1942

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

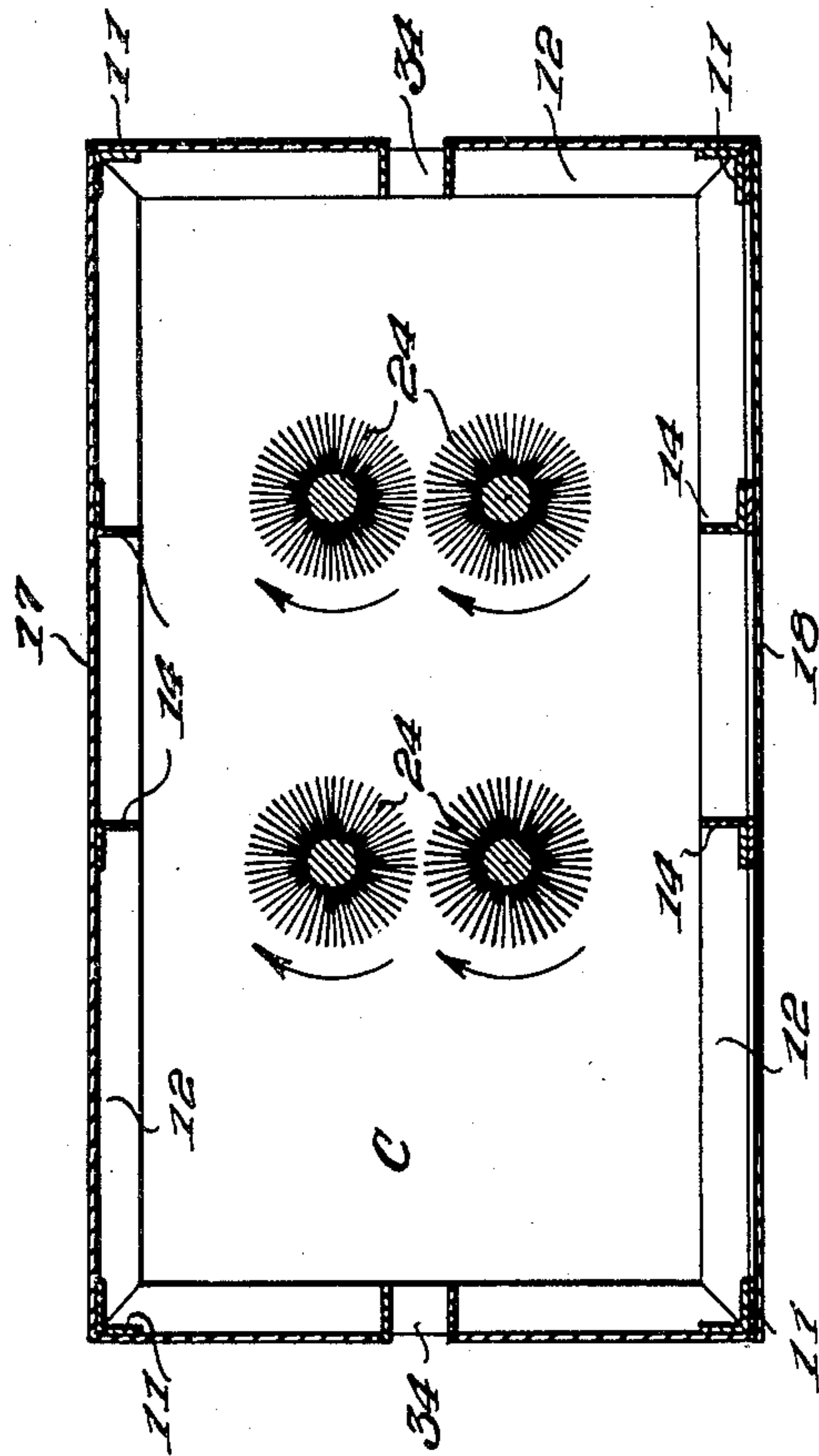
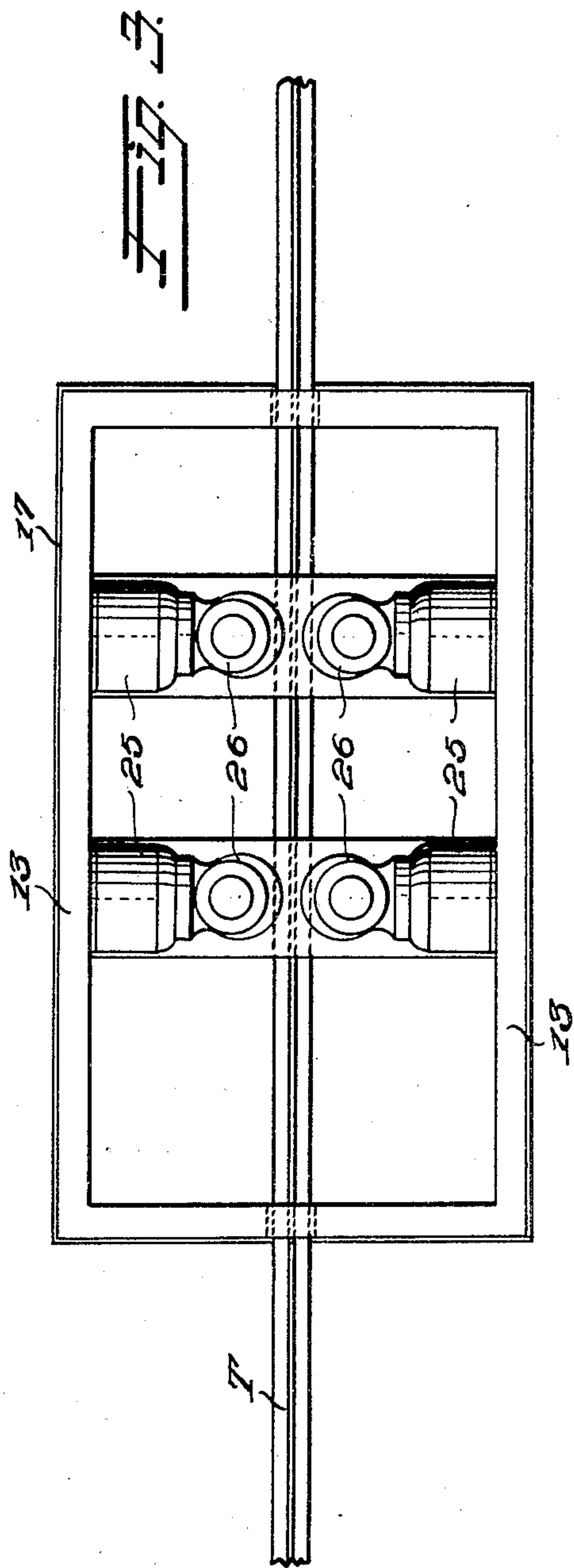


Fig. 4.

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UNITED STATES PATENT OFFICE

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SCRUBBING OR CLEANING MACHINE

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2 Claims. (Cl. 15—77)

The present invention relates to a scrubbing or cleaning machine and is adapted for simultaneously cleaning both faces of rectangular plates of various forms, sizes, and constructions, and is particularly adapted for removing paste from pasting plates which are used in tanneries in the process of manufacturing leather, as is clearly disclosed in my Patent No. 2,269,807, issued January 13, 1942, the present invention relating to certain improvements over the structure disclosed in said patent.

The structure in accordance with my patent includes a pair of tandem arranged brushes at each side of the path of movement of the plates through the machine, and one brush of each pair is directly driven by a motor while the other brush of each pair is driven from the first brush by means of a sprocket chain. While this drive arrangement generally is satisfactory under most cleaning conditions, it was, however, found that the flexible sprocket chain drives not only complicated the construction but also resulted in a lack of smoothness of operation.

Furthermore, the drive in accordance with the patent construction resulted in rotation of all of the brushes in the same common tangential direction with the result that the movement of the plates through the machine by action of the brushes was substantially greater than that required for thorough cleaning of the plates, with the result that in some instances the paste was not all removed from the plates. This form of drive was also found deficient in the event that it was desired to reverse the movement of an improperly cleaned plate through the machine, for the reason that the brushes all rotating in the same tangential direction were adverse to the movement of a plate through the machine in a direction opposed to the common tangential direction of movement of the brushes.

A primary object of the present invention is an improved brush drive construction for a plate cleaning machine such as disclosed in my said patent whereby a smoother operation of the brushes is obtained and the plates maintain substantially their initial rate of movement through the machine, whereby they are thoroughly cleaned by the action of the rotatable brushes.

A further object of the invention is the provision of a drive construction for laterally opposed pairs of vertically disposed scrubbing brushes, whereby the brushes are all rotated in a clock-wise direction and independently of one another.

With the above objects in view, together with

others that will become apparent in the course of the following disclosure, reference will now be had to the accompanying drawings forming part of such disclosure, and wherein:

Figure 1 is a side elevational view of the machine in accordance with a preferred embodiment of the invention.

Fig. 2 is an end elevation of the machine.

Fig. 3 is a top plan view of the machine.

Fig. 4 is a horizontal sectional view in a plane substantially as represented by the line 4—4 in Fig. 1.

It is to be noted that only so much of the cleaning machine is shown in the drawings as will clearly illustrate the structure forming the subject-matter of the present invention. The machine in practice will, of course, include plate or brush moistening means and other necessary elements, such as disclosed in said patent, or the present brush drive structure may find ready adaptation to plate cleaning machines structurally differing from that disclosed in the patent.

In the drawings, the numeral 10 designates a frame in its entirety. This frame may be of any convenient construction but preferably comprises angular vertical corner supports 11, base supports 12, and supports 13 interconnecting the tops of the vertical supports 11. The frame further includes vertical supports 14 at opposite sides thereof, as well as longitudinal supports 15 adjacent the top of the frame and which are interconnected at their ends by transverse supports 16. As in said patent, the frame is preferably enclosed between supports 12 and 15 by glass plates 17 (Figs. 3 and 4) which include a door or doors as indicated at 18 in Fig. 4.

Vertically disposed within the chamber C provided by the enclosed casing are scrubbing brushes 24 which are arranged in transversely aligned pairs with the peripheries of the opposed brushes of each pair so spaced as to receive the plates P to be cleaned therebetween with sufficient friction between the brushes and plates to effect proper cleansing action.

While the machine would properly function with the use of one pair of the brushes, it is, nevertheless, much more efficient when utilizing two such pairs, as illustrated in the drawings.

Contrary to the two-motor drive in the structure of my patent, the present machine is provided with four motors 25, which are preferably of one horse power and are supported on the longitudinal supports 15.

Each of the motors 25 has associated therewith a reduction gear set 26, and such gear sets

impart uniform clockwise rotation to the brushes 24 through vertical shafts 27 journaled in bearings 28 which are secured to the frame 10, as more particularly indicated in Fig. 2. These shafts 27 are rigid with the upper ends of the brushes 24, and the lower ends of the brushes include shafts 29 suitably journaled in base members 30.

It is to be particularly noted that each brush is independently driven by a motor 25 and its associated gear set 26, thereby eliminating the flexible sprocket chains of the patent for smoother operation, and the brushes are all driven in a clockwise direction for reasons hereinafter more fully set forth.

The brushes 24 may be of any desired diameter and length and are preferably made of palmetto fiber and driven at relatively high speed.

A plate transporting track T extends through the chamber C medially of the opposite sides thereof for supporting and conveying successive plates P to, through, and from the cleaning chamber C.

The plates P are preferably detachably supported by trolleys 31 having casters 32 operatively engaged with the track T. These plates P may be mechanically propelled along the track T by suitable means, but preferably they are manually propelled independently of one another and entered into the chamber C through one or the other of the end slots 34. In any event, the plates P enter the cleaning chamber at a relatively low rate of travel along the track T by the momentum given them by the manual or mechanical propelling means, as in the structure of my patent. However, in the patented structure, the rate of travel of the plates through the chamber was substantially accelerated due to the relatively fast rotating brushes moving in the same tangential direction, with the result that the plates passed through the chamber in too short a time interval for proper cleaning thereof.

Contrary to the structure of the patent, the brushes in the present machine are all driven clockwise, whereby the brushes on one side of the plate tend to move same in one direction which is neutralized by the brushes on the opposite side of the plate which tend to move it in the opposite direction. It will accordingly be seen that the plates P will retain substantially the same rate of movement through the chamber as that at which they entered the chamber by the mechanical propelling means or a manual impulse given them. Thus, the plates will

move through the chamber at relatively low speed thereby giving a sufficient time interval for proper cleansing by the rotating brushes.

Should it be found, however, that a plate is not properly cleaned when once passed through the chamber, the clockwise rotating brushes readily permit re-insertion of the plate from the other end of the chamber, since the rotating brushes have a neutral feeding effect on the plates. The brushes are preferably rotated clockwise as shown, but they may all be rotated counter-clockwise with the same neutralizing feeding effect on the plates.

While I have disclosed but a single specific embodiment of the invention, such is to be considered as illustrative only and not restrictive, the scope of the invention being defined in the subjoined claims.

What I claim and desire to secure by U. S. Letters Patent is:

1. In a machine for cleaning plates, a frame, a track supported by the frame for supporting and conveying vertically disposed plates there-through, a pair of vertically disposed rotatable brushes supported by the frame at each side of the track with the brushes of one pair closely adjacent the brushes of the other pair for operative engagement with opposed sides of the plates, a driving motor individual to each of the brushes supported by the frame above the track, and a reduction gear set supported by the frame and interposed between each brush and its individual motor, the motors being operatively connected with the brushes through the respective reduction gear sets for rotating all of the brushes in the same direction.

2. In a machine for cleaning plates, an upright frame, means supported by the frame for conveying vertically disposed plates therethrough, a vertically disposed rotatable brush at each side of the path of movement of the plates, the brushes being supported at their lower ends by vertical shafts having their lower ends journaled in frame base members, the brushes being supported at their upper ends by vertical shafts connected thereto and journaled in the frame, a transverse support included in the frame and through which the upper ends of the last named shafts extend, a reduction gear set operatively connected to each said shaft upper end, and a motor having a horizontal armature shaft operatively connected to each gear set, with the motors positioned on said support in opposed lateral relation outwardly of said reduction gear sets.

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