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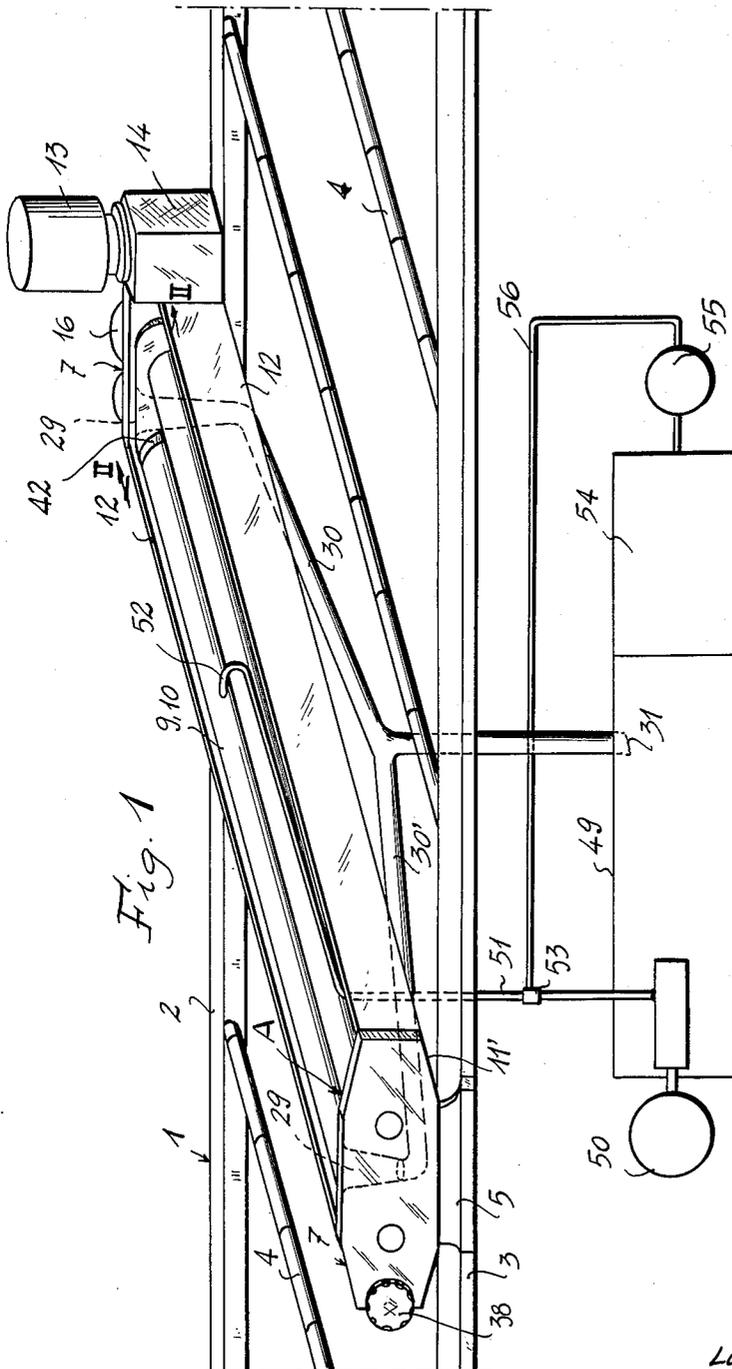
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ROLLER DEVICE FOR THE PAINTING OF GLASS OR CRYSTAL
PLATES, AND OF FLAT SURFACES IN GENERAL

Filed Aug. 13, 1962

4 Sheets-Sheet 1



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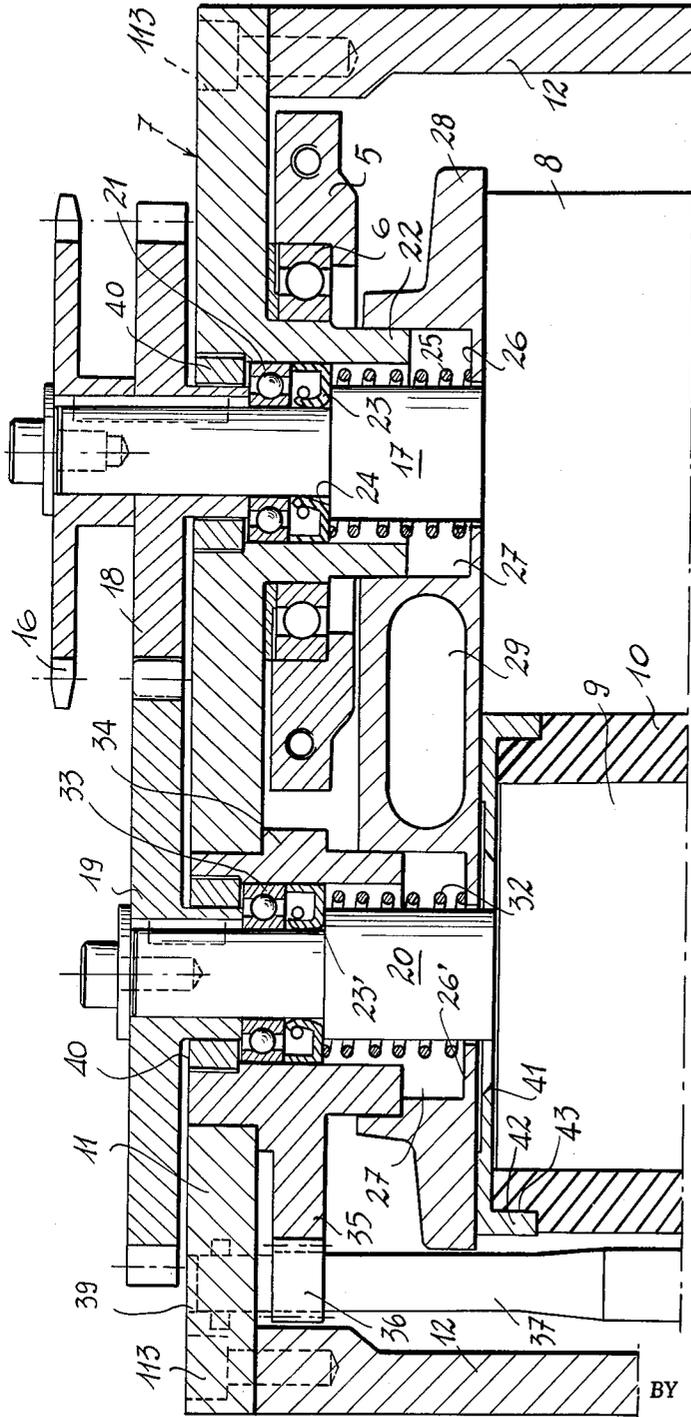


Fig. 4

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ROLLER DEVICE FOR THE PAINTING OF GLASS OR CRYSTAL PLATES, AND OF FLAT SURFACES IN GENERAL

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This invention relates to a device by which glass or crystal plates, and flat surfaces in general, can be painted by means of a set of rollers.

The already known roller devices designed for the above purposes show many drawbacks. First of all, they cause the breakage of a more or less high percentage of the processed plates, or at least a non-uniform painting of some plates is obtained, due to the fact that the plate thickness is not always constant within the same lot, due to the unavoidable manufacturing tolerances, whereby a pressure higher or lower than the pre-established value is exerted by the rollers. In fact, the rollers of such devices do not adjust themselves automatically to the thickness of the plates; they only are adjusted by hand to a theoretical thickness before the device is started. Moreover, a drying of the paint, which is fed by hand between the rollers, often occurs, whereby solvents have to be added periodically, and the device is to be stopped at intervals for cleaning the rollers. The painting is performed, in an already known device, by two rollers, i.e. a steel roller and a rubber-coated roller. The rubbing of rubber coating ends against the stationary outer supporting walls results in a very quick wear and tear thereof, with consequent infiltrations and loss of paint. Moreover, the film of paint is not spread in an absolutely consistent and uniform manner across the rollers, whereby the paint film will show adjoining tracts with different capacity. Finally, since the paint film is not continuously renewed on the rollers, flakes of dried paint are formed, while on the other hand thick, seamlike deposits of paint in excess, are laid onto the plate edges.

The object of this invention is the provision of a device which is free from the above stated drawbacks, and that is characterized essentially in that it comprises a pair of rollers driven by a motor-reduction unit and supported by a frame, which is tiltable about a horizontal axis.

According to a special feature of the invention, the paint is fed to the rollers by a pump, and the excess of paint flows toward the roller faces and then into a return piping, by which such paint is led again into the paint tank, wherefrom it is fed once more to the rollers by the above stated pump.

According to a further feature of the invention, resilient rings, having a diameter slightly greater than the outside diameter of the rubber covering, are fitted on both ends of the rubber covered roller. Such rings are designed to act as seals, by adhering against the steel roller.

The invention will be disclosed in the following detailed description of a preferred embodiment form thereof, as shown in the accompanying drawings, in which

FIG. 1 is a diagrammatic perspective view of the device according to the invention.

FIG. 2 is a section taken along the line II—II of FIG. 1.

FIG. 3 is a partial section taken along the line III—III of FIG. 2.

FIG. 4 is a partial section taken along the line IV—IV of FIG. 3.

Referring now to above figures, the device according to the invention comprises a frame, generally indicated with 1, and consisting of two side members 2 and 3, connected with one another by cross members (not shown), and serving as supports for carrying round rods or rollers 4, whereon the plate to be painted is laid. A frame, generally indicated with 7, is swingingly supported in bearings 6, mounted on supports 5, that are secured to the side members 2 and 3 (see FIGS. 1 and 4). The painting rollers 8 and 9 are revolvingly fitted in the above frame 7. Both said rollers are of steel, and the roller 9 is covered by a rubber sheathing 10.

The frame 7 consists of two side members 11 and 11', connected with one another by the cross members 12 and secured by the screws 113. A motor-reduction unit (see FIGS. 1 and 2), that consists of the electric motor 13 and of reduction gear 14, is secured to said frame, adjacent to one end of one of the cross members 12. The output gear (not shown) of the motor-reduction unit, is in mesh with a gear 16 (see FIG. 4), which is secured to journal 17 of the roller 8. A further gear 18, keyed on the same journal 17, is in mesh with a gear 19, which is secured to journal 20 of the rubber covered roller 9. The journal 17 is turnably mounted by means of bearing 21 in a journal box 22 integral with side member 11. 23 is a packing, which is tightly pressed against the journal 17, the inside surface of journal box 22 and the step 24 of journal 17. The packing 23 is acted upon by a compression spring 25, the other end of which presses against the bottom 26 of a hole 27 cut out of a plate 28, which is thereby forced against the ends of rollers 8 and 9.

The section 30 of a duct that leads at 31 into the paint tank 49, is connected with the lower end of a channel 29 formed in the plate 28 (see FIGS. 1 and 4). At the journal 20 of roller 9a compression spring 32 presses with one end against the bottom 26' of a hole 27', wherein the journal 20 is located. The opposite end of said spring 32 presses against a packing 23', similar to the previously described packing 23 (see FIG. 4). The journal 20 is supported, by means of a ball bearing 33, in an eccentric journal box 34 fitted with a toothed segment 35, that meshes with a pinion 36, keyed on a shaft 37, which is supported at 39 (by already known means) by the side member 7. Said shaft 37 projects outwardly of plate 11', opposite to the plate 11 shown in the FIG. 4, and an adjusting knob 38 is fitted on its outer end, thus allowing to turn the shaft 37, whereby the roller 9 can be moved to, and from the roller 8.

40 are threaded plugs that serve as stops. The eccentric member 34 is frictionally supported in the side member 11, as shown in the FIG. 4.

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The plate 28 is forced by the springs 32 and 25 against the annular flange 41 of a resilient ring 42, made of a rubber softer than that of sheathing 10. The axial portion of ring 42 is engaged with a groove 43 formed on the end of sheathing 10, and extends slightly beyond the outer peripheral surface thereof, in order that its jutting portion is always kept pressed against the contour of roller 8, whichever the relative spacing of rollers 8 and 9 may be.

The same components (though not shown) are fitted on the end of frame 7 opposite to that shown in the FIG. 4 and marked with A in the FIG. 1—except for the gears 16, 18 and 19. In other words, a plate similar to plate 28, two holes similar to holes 27 and 31, two compression springs similar to springs 25 and 32, two bearings similar to bearings 21 and 33, an eccentric body similar to body 34, and a pinion similar to pinion 36 are provided on the side as indicated with A in the FIG. 1.

The channel 29' similar to channel 29, and provided on the frame side A, is connected with a piping 30', that in turn is connected with the piping 31, whereby the paint which is flowing therein can be brought back into the tank 49. The paint contained in the tank 49 is fed by a pump 50, to duct 51, that leads at 52 between the rollers (see FIGS. 1 and 2). A second tank 54 contains a solvent. A hand operated valve 53, fitted in the piping 51, allows to send into the duct 51 solvent sucked from tank 54 by the centrifugal pump 55, through delivery duct 56.

The operation of the aforescribed device is as follows: assuming that a plate X is laid onto the roller 4, that the motor-reduction unit 13-14 is running, and that paint is fed by the pump 50 between the rollers 8 and 9. Then the sheathed roller 9 is kept in contact with the plate X, owing to its swinging suspension. In fact, it must be considered that the moment exerted by the roller 9 due to the length and resulting weight is substantially greater than that of motor-reduction unit 13-14, whereby the sheathed roller will always adhere against the plate X. Plate X will be painted and the excess paint flows continuously back into tank 49, across the ducts 29, 30 and 30'.

When a change is to be made in the amount of paint which is transferred onto the plate X, it will be sufficient to turn the knob 38, thereby moving the sheathed roller 9 to, or from the steel roller 8 by the required amount.

After the end of the operation, both rollers can be cleaned by opening valve 53, and starting at the same time the centrifugal pump 55, by which solvent is sucked from the tank 54.

In some cases, the possibility exists to have both pumps 50 and 55 operated at the same time, thereby diluting the paint before it comes between the rollers 8 and 9.

What I claim is:

1. In a roller device for painting the top surface of a plate, in combination, support means for supporting a plate to be painted and for advancing the plate in one direction; a pair of rollers having parallel axes extending substantially normal to said one direction and being located above and spaced from said support means, said axes being spaced from each other so that the peripheral surfaces of said rollers closely approach each other to form a narrow gap facing said support means between adjacent surface portions of said rollers; a rigid integral frame mounted on said support means tiltable about a tilting axis; fixed bearing means carried by said frame and supporting one of said rollers turnably about its axis; eccentric bearing means carried by said frame and having an axis spaced from and parallel to the axis of said one roller and turnably supporting the other of said rollers about an axis the distance of which from the axis of said one roller is adjustable by turning said eccentric bearing means to thereby adjust the gap between said rollers; and drive means mounted on said

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frame and being operatively connected to said rollers for rotating the same about their axes, said frame and the elements mounted thereon arranged to keep said other roller in contact with a plate placed on said support means.

2. In a roller device for painting the top surface of a plate, in combination, support means for supporting a plate to be painted and for advancing the plate in one direction; a pair of rollers having parallel axes extending substantially normal to said one direction and being located above and spaced from said support means, said axes being spaced from each other so that the peripheral surfaces of said rollers closely approach each other to form a narrow gap facing said support means between adjacent surface portions of said rollers; a rigid integral frame mounted on said support means tiltable about a tilting axis; fixed bearing means carried by said frame and having an axis coinciding with said tilting axis and supporting one of said rollers turnable about the axis of said fixed bearing means; eccentric bearing means carried by said frame at a location to one side of said tilting axis and turnably supporting the other of said rollers about an axis parallel to said tilting axis and the distance of which from said tilting axis is adjustable by turning said eccentric bearing means to thereby adjust the gap between said rollers; a rubber sleeve covering the peripheral surface of said other roller; and drive means mounted on said frame at the other side of said tilting axis and being operatively connected to said rollers for rotating the same about their axes, said frame and the elements mounted thereon arranged to keep said other roller in contact with a plate placed on said support means.

3. In a roller device for painting the top surface of a plate, in combination, support means for supporting a plate to be painted and for advancing the plate in one direction; a pair of rollers having parallel axes extending substantially normal to said one direction and being located above and spaced from said support means, said axes being spaced from each other so that the peripheral surfaces of said rollers closely approach each other to form a narrow gap facing said support means between adjacent surface portions of said rollers; a frame mounted on said support means and supporting said rollers turnably about their axes, said frame being tiltable about a tilting axis coinciding with the axis of one roller, the axis of the other roller being located to one side of said tilting axis; a rubber sleeve covering the peripheral surface of said other roller; and drive means mounted on said frame at the other side of said tilting axis and being operatively connected to said rollers for rotating the same about their axes, said drive means comprising a motor, a gear reduction unit driven by said motor and having a drive gear, a first gear coaxially fixed to said one roller and meshing with said drive gear, and a second gear coaxially fixed to said other roller and meshing with said first gear, said frame and the elements mounted thereon arranged to keep said other roller in contact with a plate placed on said support means, whereby due to the arrangement of said drive means on said frame the pressure of said other roller on a plate to be painted will not be changed due to variations of the plate thickness and resulting tilting of said frame.

4. A roller device as set forth in claim 1 and including means for adjusting the position of said eccentric bearing means to thereby adjust the gap between said rollers.

5. A roller device as set forth in claim 4 wherein said means for adjusting the position of said eccentric bearing means to thereby adjust the gap between said rollers include a gear segment fixed to said eccentric bearing means, a shaft extending parallel to the axis of said eccentric bearing means turnably mounted on said frame, a pinion carried by said shaft and meshing with said

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gear segment, and operating means connected to said shaft for turning the same.

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