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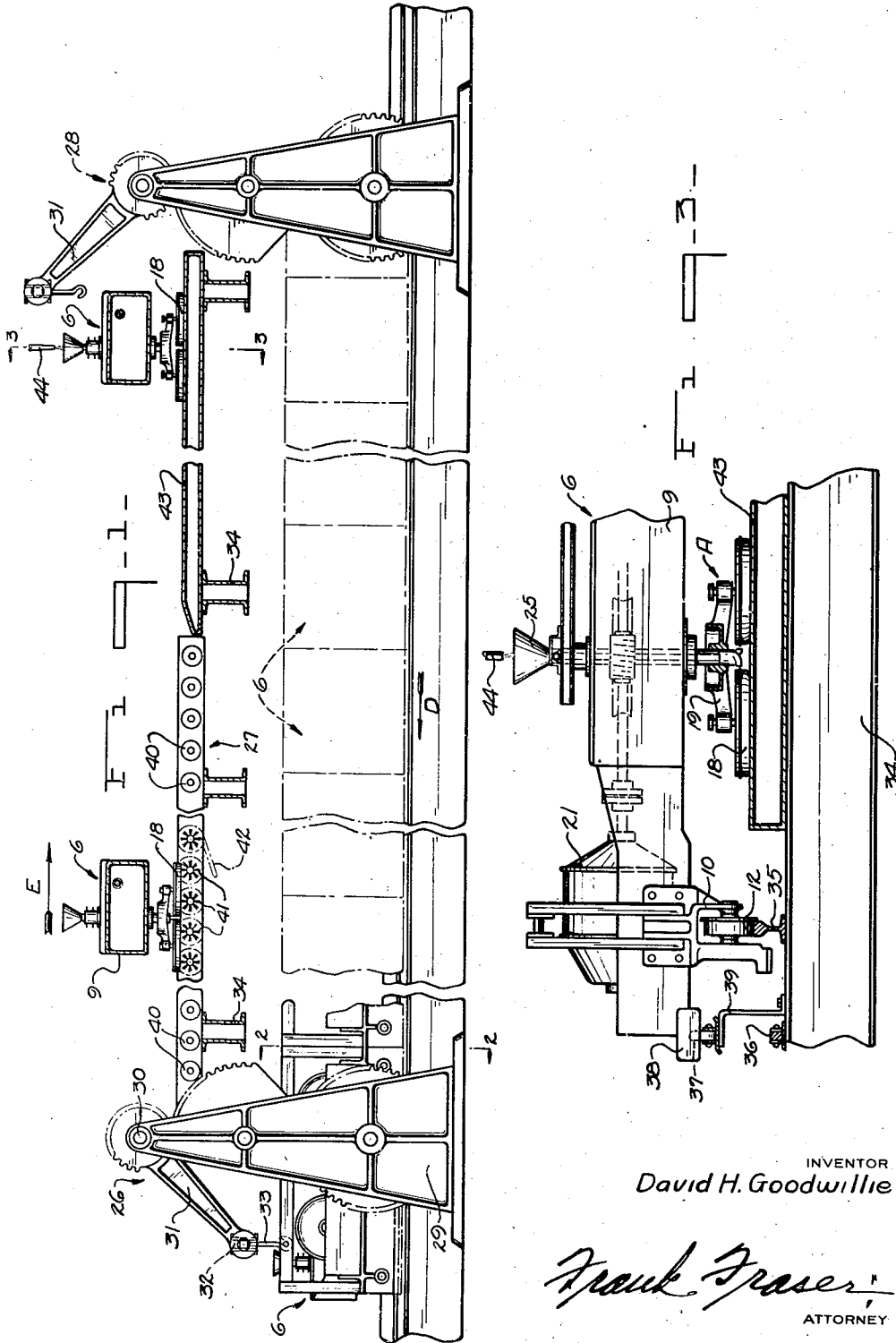
D. H. GOODWILLIE

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METHOD AND APPARATUS FOR POLISHING SHEET GLASS

Filed May 1, 1931

2 Sheets-Sheet 1



INVENTOR

David H. Goodwillie

Frank Fraser

ATTORNEY

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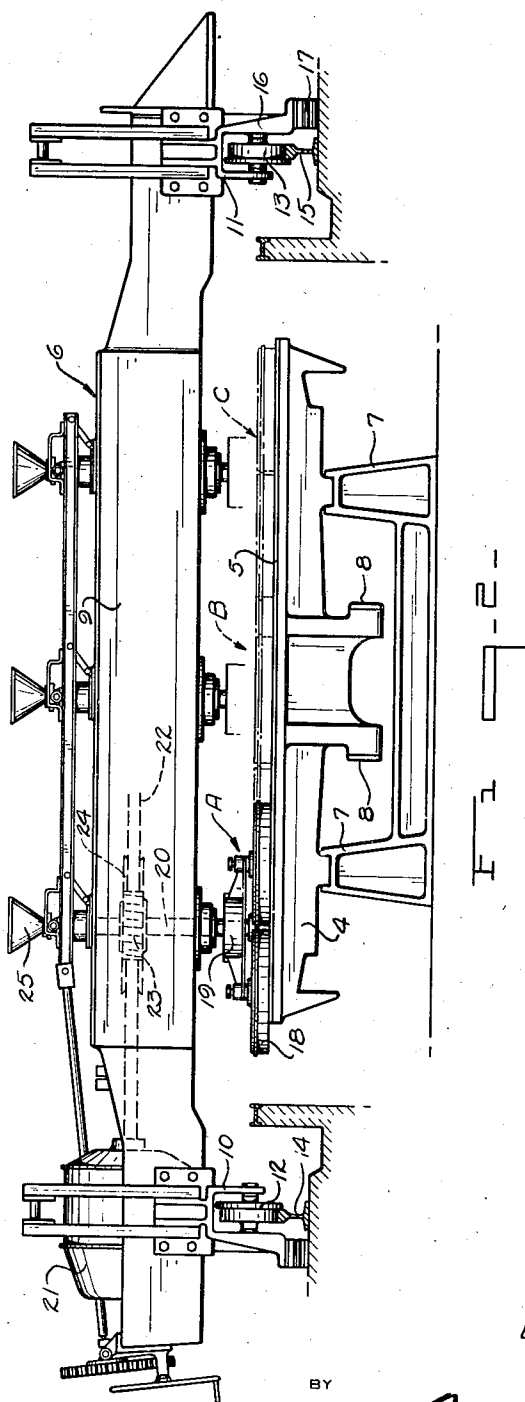
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INVENTOR
David H. Goodwillie

BY
Frank Fraser
ATTORNEY

UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR POLISHING
SHEET GLASSDavid H. Goodwillie, Toledo, Ohio, assignor to
Libbey-Owens-Ford Glass Company, Toledo,
Ohio, a corporation of Ohio

Application May 1, 1931, Serial No. 534,259

16 Claims. (Cl. 51-110)

This invention relates to the art of surfacing flat sheets of material such as glass and the like and more particularly to the polishing thereof.

In one well-known process for surfacing sheet glass commonly termed the continuous system, the grinding and polishing of the glass is accomplished in a straight-away operation, a plurality of glass sheets to be surfaced being supported upon a train of cars or carriers and passed in a definite substantially horizontal path first beneath a series of grinding units and then beneath a series of polishing units. The present invention is adapted for use in such a system wherein the polishing units are caused to travel in the same direction as the glass sheets during the polishing operation and also wherein after each unit has completed its operative course upon the glass, it is removed therefrom and returned to the start of the next operative course.

The operative surfaces of the polishing runners are usually of felt or the like and these are caused to take up rouge by supplying the runners while operating with a mixture of rouge and water. After each unit has completed its operative course upon the glass, it is desirable that the polishing felts be washed and treated so that the runners can again effectively operate on their next course to polish the glass coming from the grinding and smoothing operations.

An important object of the present invention, therefore, resides in the provision of a novel method and means for cleaning and/or treating the felts of the polishing runners during the transit of said runners from the end of one operative course to the start of the next operative course so as to prepare them for the next polishing operation.

Another important object of the invention resides in the provision of a method and means for effecting a drying and conditioning of the felts of the polishing runners subsequent to the cleaning thereof so that when they are again brought to the start of their operative course, they will be in a condition to effect immediate polishing of the glass.

Other objects and advantages of the invention will become more apparent during the course of the following description when taken in connection with the accompanying drawings.

In the drawings forming a part of this application and wherein like numerals are employed to designate like parts throughout the same,

Fig. 1 is a fragmentary side elevation, partially

in section, disclosing apparatus provided by the present invention,

Fig. 2 is a section taken substantially on line 2-2 of Fig. 1, and

Fig. 3 is a section taken substantially on line 3-3 of Fig. 1.

Referring to the drawings, 4 designates one of a series of cars or tables which are adapted to be arranged end to end and movable in a definite substantially horizontal path to carry the glass sheets 5 mounted thereupon first beneath a series of grinding units (not shown) and then beneath a series of polishing units 6. The tables 4 are slid forwardly upon fixed guides 7 and may be driven in any desired manner such as by means of suitable drive pinions which may mesh with the rack bars 8.

Each polishing unit 6 includes a hollow supporting cross-beam 9 mounted at its opposite ends upon trucks 10 and 11 having wheels 12 and 13 which run upon tracks 14 and 15 respectively arranged outwardly of but parallel with the tables. Carried by each truck 10 and 11 is a depending bracket arm 16 provided on the bottom thereof with teeth 17 engageable by a suitable drive pinion (not shown) whereby the polishing unit may be caused to move in the same direction as the tables 4.

Each polishing unit 6 also includes a plurality of groups of polishing runners A, B and C arranged transversely of the tables 4. Each group of runners preferably consists of three polishing blocks 18 covered by suitable pads of felt or the like and being carried by a spider 19 secured to the lower end of a vertical spindle 20 which extends upwardly through cross-beam 9 and is journaled in bearings carried thereby. The several groups of polishing runners of each unit 6 may be driven from a single motor 21, the shaft 22 thereof carrying a plurality of worms 23, one for each group of runners and meshing with a worm gear 24 keyed to the respective vertical spindle 20. The polishing blocks 18 are so mounted upon the spider 19 that they are permitted to freely rotate about their individual axes while being simultaneously carried in a circular path upon rotation of spindle 20.

To assist in the polishing of the glass, a suitable polishing material such as rouge or the like is adapted to be fed upon the surface of the glass and this may be accomplished by utilizing a vertical spindle 20 of hollow construction and in feeding the rouge downwardly therethrough, the rouge being supplied to the spindle through a

trough 25 associated with the upper end thereof.

As set forth above, the polishing units 6 are adapted to travel with the tables in the direction of movement indicated by the arrow D in Fig. 1. As each succeeding polishing unit completes its operative course from right to left, it is adapted to be lifted upwardly off of the glass by the lifting means 26 and placed upon the super-structure 27 built above the line of tables, and returned thereon from left to right as indicated by the arrow E to the start of its next operative course, the said unit being then again lowered onto the glass by the lowering means 28 which is of substantially the same construction as the lifting means 26. Inasmuch as the specific construction of the means for raising and lowering the polishing units relative to the glass constitutes no part of the present invention per se, they will not be described in detail herein. However, it might be briefly stated that the lifting means (and the lowering means is of the same construction) includes a vertical supporting frame 29 positioned at each side of the tables and within the upper ends of which is mounted a transverse shaft 30 carrying adjacent each end a lifting arm 31, said arms being connected together at their outer ends by a rotatable girder 32 carrying two hooks 33 which engage the polishing unit adjacent the opposite ends thereof. The lifting arms and the lowering arms may be caused to oscillate by any suitable drive means to effect the desired raising and lowering of the polishing units.

The super-structure 27 includes a plurality of spaced cross-beams 34 supporting the longitudinally extending rails or tracks 35 upon and along which the polishing units are caused to move. That is to say, when the polishing unit is lifted upwardly by the lifting arms 31, it is placed thereby upon the rails 35 which are engaged by the supporting wheels 12. The movement of the polishing units from left to right may be effected in any preferred manner such as by the provision of an endless chain 36 located at each end of the unit and carrying pusher members 37 which are adapted to engage plates 38 secured to the polishing unit. The upper flight of the endless chain 36 may be supported upon the horizontal portion of a bracket 39.

The super-structure 27 also includes a plurality of horizontally arranged rollers 40 constituting a runway for the polishing runners, the felts of the said runners being cleaned during the passage thereof over the runway by cleaning devices of any convenient form. These may consist, however, of a plurality of rotatable washing brushes 41, preferably supplied with water and adapted to brush the surface of the felts. The brushes 41 may be driven in any desired manner such as by means of a sprocket chain 42 trained about sprockets carried thereby, while the rollers 40 may be driven or not as found most suitable.

Positioned to the right of the rollers 40 is a stationary supporting platform 43 also constituting a part of the runway and over which the polishing units 6 are moved, with the blocks 18 thereof resting thereupon. In the event the felts of the polishing blocks are still wet when they are returned upon the glass after washing, it would take a certain amount of time for the said felts to dry out and take up sufficient rouge to effect a polishing of the glass. Therefore, the platform 43 is provided to effect the desired drying and/or conditioning of the felts of the polishing blocks subsequent to the washing thereof so

that, when the runners are returned to the glass, they will be in proper condition to effect immediate polishing thereof. While it is undesirable for the polishing felts to become caked with rouge on the one hand, yet it is necessary on the other hand that they do take up a certain amount of rouge before they are capable of polishing the glass. If the polishing felts are returned to the glass wet and without any rouge thereon, it will be readily apparent that a certain portion of their travel will be consumed in drying and impregnating the same with rouge during which time they will have no polishing action on the glass. Obviously, this is an undesirable condition.

According to the present invention, as the polishing blocks 18 leave the runway rollers 40 subsequent to the washing of the felts thereof, they are received upon the stationary platform 43 and are permitted to remain in contact therewith during the travel of the unit thereover. Furthermore, the polishing blocks are continued to rotate, being driven from motor 21, and there is also fed to the blocks from one or more supply pipes 44 a suitable quantity of rouge which flows downwardly through the hollow spindle 20 onto the platform 43. As the blocks are caused to rotate, it will be apparent that they operate upon the platform in substantially the same manner as though they were actually polishing a sheet of glass. Consequently, the felts of the polishing blocks will gradually become dried out and will also be caused to take up or become impregnated with the desired amount of rouge as they are caused to slide over the stationary platform so that when they are returned to the glass at the start of their operative course, they will be in a condition to effect immediate polishing thereof and little or no time will be lost before they begin to have an actual polishing action on the glass. In order to facilitate the drying of the felts, the platform 43 may be hollow and a heating medium circulated therethrough, or the platform may consist of a single plate having suitable heating means associated therewith. This invention, however, is in no way restricted to the particular type of platform nor to any specified means for heating the same.

It is to be understood that the form of the invention herewith shown and described is to be taken as the preferred embodiment of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combination of means located above the glass carrying tables adapted to support and convey the runners from the finish to the start of their operative course, means for washing the felts of said runners as they are moved along by said last-mentioned means, and means for also conditioning the felts during such travel and subsequent to the washing thereof, including a horizontal stationary platform over which the said runners are movable with the felts thereof in contact therewith, and means for heating said platform to dry the said felts while in engagement therewith.

2. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combina-

tion of means located above the glass carrying tables adapted to support and convey the runners from the finish to the start of their operative course, means for washing the felts of said runners as they are moved along by said last-mentioned means, and means for also conditioning the felts during such travel and subsequent to the washing thereof, including a horizontal stationary platform over which the said runners are movable with the felts thereof in contact therewith, means for heating said platform to dry the said felts while in engagement therewith, and means for rotating the polishing runners while resting upon the stationary platform.

3. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combination of means located above the glass carrying tables adapted to support and convey the runners from the finish to the start of their operative course, means for washing the felts of said runners as they are moved along by said last-mentioned means, and means for also conditioning the felts during such travel and subsequent to the washing thereof, including a horizontal stationary platform over which the said runners are movable with the felts thereof in contact therewith, and means for supplying a polishing material to the runners as they travel over the said platform.

4. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combination of means located above the glass carrying tables adapted to support and convey the runners from the finish to the start of their operative course, means for washing the felts of said runners as they are moved along by said last-mentioned means, and means for also conditioning the felts during such travel and subsequent to the washing thereof, including a horizontal stationary platform over which the said runners are movable with the felts thereof in contact therewith, means for rotating the polishing runners while resting upon the stationary platform, and means for supplying a polishing material to said runners as they travel over the stationary platform.

5. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combination of means located above the glass carrying tables adapted to support and convey the runners from the finish to the start of their operative course, means for washing the felts of said runners as they are moved along by said last-mentioned means, and means for also conditioning the felts during such travel and subsequent to the washing thereof, including a horizontal stationary platform over which the said runners are movable with the felts thereof in contact therewith, means for heating the stationary platform, means for rotating the runners while they are in engagement with the platform, and means for feeding a polishing material thereto.

6. In that process of polishing sheet glass wherein both the glass carrying tables and the polishing runners travel, and further, wherein the polishing runners are conveyed from the finish to the start of their operative course, the method of treating the runners during the travel thereof from the finish to the start of said operative course consisting in first washing the felts of said runners, then passing the runners

over a stationary surface with the felts in contact therewith, and in effecting a positive drying of the felts while in engagement with said surface.

7. In that process of polishing sheet glass wherein both the glass carrying tables and the polishing runners travel, and further, wherein the polishing runners are conveyed from the finish to the start of their operative course, the method of treating the runners during the travel thereof from the finish to the start of said operative course consisting in first washing the felts of said runners, then passing the runners over a stationary surface with the felts in contact therewith, in applying heat to the surface to effect a drying of the felts, and in simultaneously maintaining the runners in rotation.

8. In that process of polishing sheet glass wherein both the glass carrying tables and the polishing runners travel, and further, wherein the polishing runners are conveyed from the finish to the start of their operative course, the method of treating the runners during the travel thereof from the finish to the start of said operative course consisting in first washing the felts of said runners, then passing the runners over a stationary surface with the felts in contact therewith, maintaining the runners in rotation, and simultaneously feeding a polishing material thereto.

9. In that process of polishing sheet glass wherein both the glass carrying tables and the polishing runners travel, and further, wherein the polishing runners are conveyed from the finish to the start of their operative course, the method of treating the runners during the travel thereof from the finish to the start of said operative course consisting in first washing the felts of said runners, then passing the runners over a stationary surface with the felts in contact therewith, applying heat to said surface to effect a drying of the felts, maintaining the runners in rotation, and simultaneously feeding a polishing material thereto.

10. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combination of means located above the glass carrying tables adapted to support and convey the runners from the finish to the start of their operative course, means for washing the felts of said runners as they are moved along by said last-mentioned means, and means for also drying the felts during such travel and subsequent to the washing thereof, including a horizontal stationary imperforate platform over which the said runners are movable with the felts thereof in contact therewith.

11. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combination of means located above the glass carrying tables adapted to support and convey the runners from the finish to the start of their operative course, means for washing the felts of said runners as they are moved along by said last-mentioned means, and means for also drying the felts during such travel and subsequent to the washing thereof, including a horizontal stationary imperforate platform over which the said runners are movable with the felts thereof in contact therewith, and means for heating said platform.

12. In that process of polishing sheet glass wherein both the glass carrying tables and the

polishing runners travel, and further, wherein the polishing runners are conveyed from the finish to the start of their operative course, the method of treating the runners during the travel thereof from the finish to the start of said operative course consisting in first washing the felts of said runners, then passing the runners over a stationary unbroken surface with the felts in contact therewith, and in heating the said surface to dry the felts while in engagement therewith.

13. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combination of means located above the glass carrying tables adapted to support and convey the runners from the finish to the start of their operative course, means for washing the felts of said runners as they are moved along by said last-mentioned means, and means for also impregnating the said felts with a polishing material during such travel subsequent to the washing thereof and before being returned to the glass.

14. In apparatus for the continuous polishing of glass in which both the glass carrying tables and the polishing runners travel, the combination of means located above the glass carrying tables adapted to support and convey the run-

ners from the finish to the start of their operative course, and means for successively washing, drying, and impregnating the felts of said runners with a polishing material as they are moved along by said last-mentioned means.

15. In that process of polishing sheet glass wherein both the glass carrying tables and the polishing runners travel and further wherein the polishing runners are conveyed from the finish to the start of their operative course, the method of treating the runners during the travel thereof from the finish to the start of said operative course, consisting in first washing the felts of said runners, and in then impregnating the said felts with a polishing material before being returned to the glass.

16. In that process of polishing sheet glass wherein both the glass carrying tables and the polishing runners travel and further wherein the polishing runners are conveyed from the finish to the start of their operative course, the method of treating the runners during the travel thereof from the finish to the start of said operative course, consisting in first washing the felts of said runners, and in then drying the felts and impregnating the same with a polishing material before being returned to the glass.

DAVID H. GOODWILLIE.