

Dec. 1, 1936.

R. PETERS

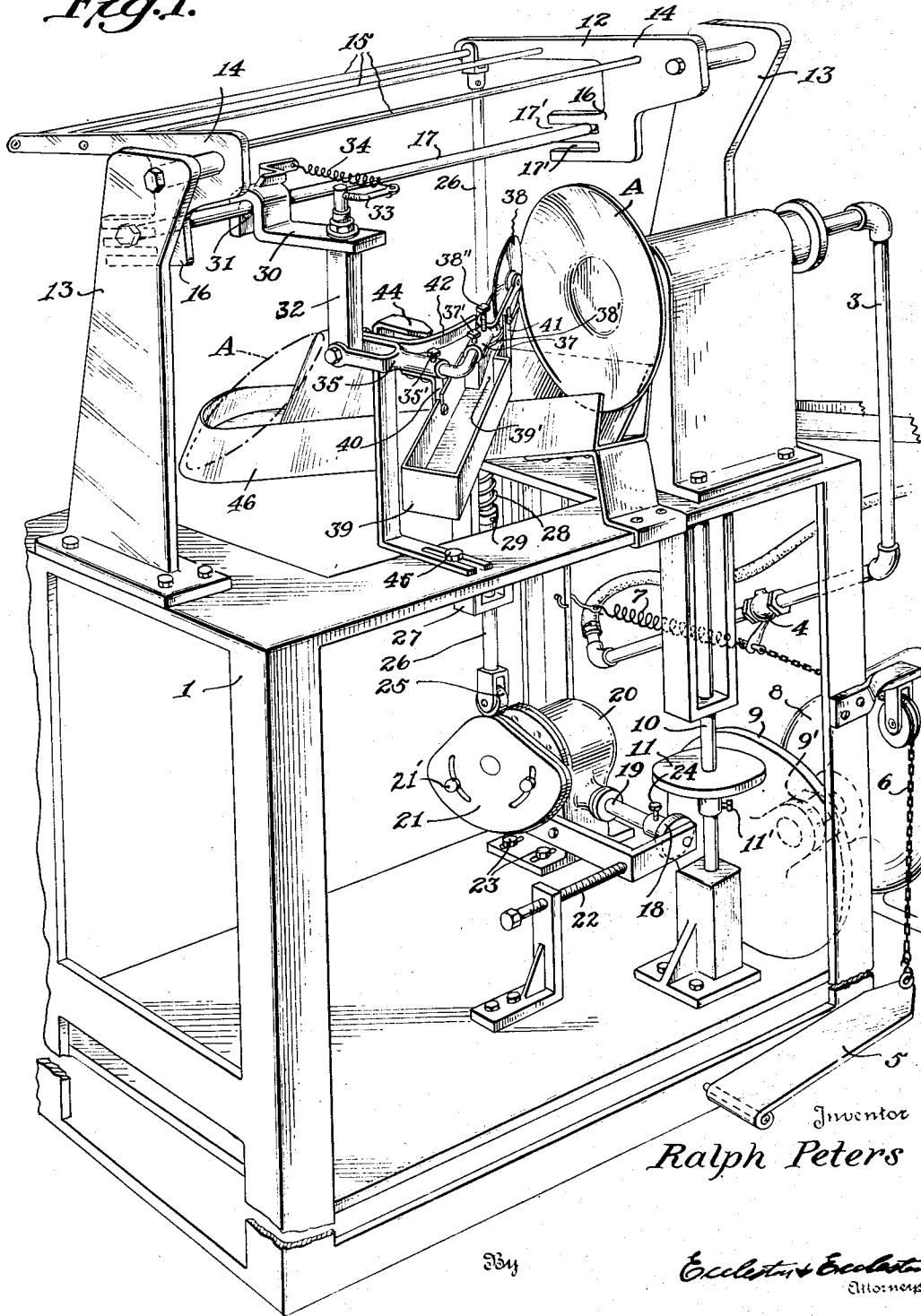
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BANDING MACHINE

Filed April 1, 1935

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*Fig. 1.*



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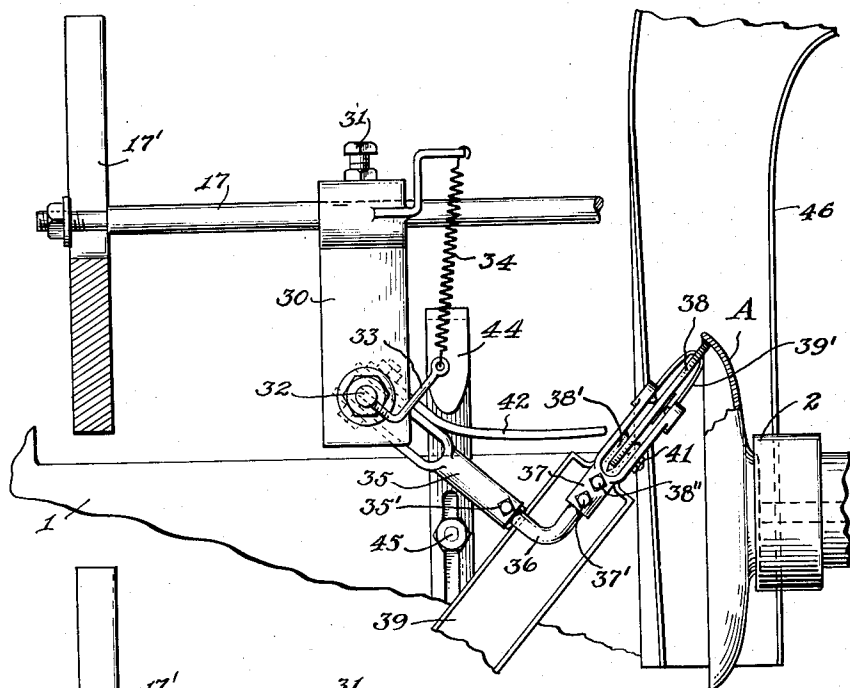
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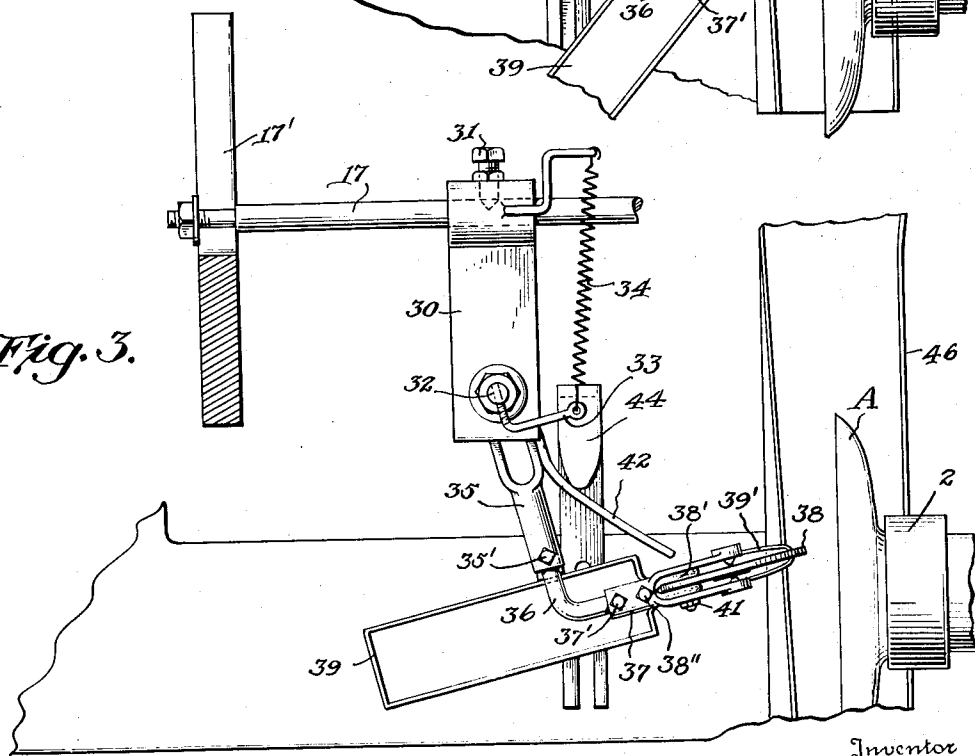
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*Fig. 2.*



*Fig. 3.*



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## UNITED STATES PATENT OFFICE

2,062,425

## BANDING MACHINE

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9 Claims. (Cl. 91—12)

The invention relates to the painting of bands on ceramic ware, particularly such articles as saucers, plates, bowls and the like; and one of the objects of the invention is to provide a simple and inexpensive device which will efficiently apply the paint bands automatically, thus avoiding the hand painting of such articles.

In the painting of saucers, plates, bowls and similar articles different problems are involved than are presented in the painting of tumblers and similar articles. Saucers, plates, etc., usually have a flat or substantially flat central portion, and an upwardly curved or upwardly inclined peripheral portion. While the present invention is in no manner limited to the painting of bands on such peripheral portions, yet the invention is particularly well adapted for such work. In painting bands on these peripheral portions it is important that the paint roller contact with the surface at a particular angle with respect thereto, and one of the objects of the invention is to provide a machine in which the roller will contact the ware at the proper angle.

A further object of the invention is to provide a mechanism by which the angle of contact can be varied to suit the various peripheral shapes of different articles; and which can also be adjusted to suit ware of different sizes, with or without varying the angle of contact.

Another object of the invention is to provide means whereby the paint roller will be resiliently maintained against the surface of the article during the painting operation.

Still another object of the invention is to provide means for automatically disposing of the articles after they have been banded.

Various other objects and advantages of the invention will be apparent to those skilled in the art, from the following description when taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of the apparatus.

Figure 2 is a fragmentary plan view showing the paint roller in contact with the article being banded; and

Figure 3 is a similar view showing the roller removed from the article.

Referring to the drawings in more detail, and particularly to Figure 1, numeral 1 refers to a table or other suitable support for the apparatus. Numeral 2 indicates a chuck to receive the saucer, plate, bowl or other article to be banded. The chuck is in communication with any desired source of vacuum (not shown) by means of a pipe 3. The article to be decorated is placed in

the chuck by hand and is maintained there by the vacuum during the banding operation. The vacuum is preferably broken before the article is removed, and for this purpose a valve 4 is provided in the vacuum line 3. Of course the valve can be operated by hand, but I preferably provide a foot treadle 5 connected with the valve by means of a chain 6 or the like. When the foot treadle is depressed the valve will be operated to break the vacuum, and when the foot is lifted a spring 7 will operate the valve in the opposite direction to throw the chuck into communication with the source of vacuum.

Numeral 8 refers to a motor which drives a friction disc 9. A vertical shaft 10 carries a friction disc 11 which is in engagement with the friction disc 9, whereby the shaft is continuously rotated. This vertical shaft 10 continuously rotates the chuck 2, by means of bevel gears (not shown). In applying bands of paint to articles the speed of rotation of the article is important, and different speeds are desirable for articles of different sizes and for different conditions of paint. In order to obtain the most desirable speed in any particular operation, the friction disc 11 is adjustably mounted on the shaft 10 by any desired means, as by set screw 11'. To take care of wear between the friction discs, the disc 9 is adjustably mounted on the motor shaft and may be adjusted toward the disc 11 by lock nuts 9'.

Numeral 12 refers to an oscillatable frame mounted between brackets 13. This frame consists of two spaced arms 14, 14, united by tie rods 15. It will be noted that the frame is pivotally mounted at its forward end, and that the arms have downwardly and rearwardly extending portions 16 in which is adjustably mounted a rod 17. On this rod 17 is mounted the apparatus carrying the paint roller, paint reservoir, etc., but the preferred means for oscillating the frame 12 will be described before describing the apparatus carried by the frame.

Numeral 18 refers to a friction disc which is in engagement with the previously described friction disc 9. The disc 18 drives a shaft 19, which through a gear box 20 causes the continuous rotation of a split cam 21. To take care of wear between friction discs 18 and 9, the shaft 19 and its disc 18 may be adjusted toward the disc 9 by means of an adjusting screw 22; it being merely necessary to first loosen screws 23 arranged in appropriate slots in the base of the gear box 20. To vary the speed of rotation of the split cam 21, and thus vary the number of

times per minute the paint roller is moved into operative position, it is only necessary to adjust the disc 18 in or out, by means of set screw 24.

Riding upon the cam 21 is a roller 25 carried by the lower end of a connecting rod 26; the upper end of the rod being connected with the oscillatable frame 12. In the specific embodiment illustrated, the connecting rod is guided in a frame 27, and the roller 25 is urged into contact with the cam 21 by means of a coil spring 28 arranged on the connecting rod between an end of the frame and a collar 29 adjustably mounted on the connecting rod.

The continuously revolving cam 21 causes the connecting rod 26 to be raised and lowered, thereby rocking the frame 12 and moving the paint roller into and out of contact with the article to be decorated, in a manner which will be described.

As mentioned hereinbefore, the paint applying apparatus is mounted on the rod 17 carried by the rocking frame 12. This frame is pivoted at its forward end, and in the embodiment illustrated the rod 17 is positioned in the frame below and rearwardly of the frame pivot. Hence when the rear end of the frame is rocked downwardly the rod 17 and parts mounted thereon will be moved forwardly, and when the frame is rocked upwardly, the rod 17 and parts mounted thereon will be moved rearwardly. The position of the rod 17 in the frame 12 may be adjusted forward or backward in the slot 17', and the vertical position of the rod may be varied by mounting it in either of the slots 17'. Of course any other desired means may be employed for adjusting the position of the rod either vertically or horizontally.

Numeral 30 refers to a bracket which is mounted on and projects forwardly from the rod 17. Any preferred means may be employed for mounting the bracket on the rod, but I preferably employ a set screw 31 which permits adjustment of the bracket along the rod, and which also maintains the bracket in any desired plane; so that the bracket may be adjusted about the rod as a pivot or may be adjusted along the rod.

Numeral 32 indicates a vertically extending rod which projects downwardly from the bracket 30, and which has its upper portion swiveled therein. The upper reduced portion of the rod is provided with a laterally extending finger 33, to which is attached one end of a coil spring 34; the other end of the spring being attached to the bracket 30. Thus the spring tends to turn the rod 32 about its own axis.

Clamped to the lower end of the rod 32 is a sleeve member 35, in which is telescopically mounted one end of a bent rod 36; the rod being rotatably and longitudinally adjustable in the sleeve by means of a set screw 35'. On the other end of the bent rod is mounted a sleeve member 37, which may be adjusted rotatably and longitudinally of the rod by means of a set screw 37'; and the free end of the member 37 is forked to receive the paint roller 38. A wiper 38' cooperates with the paint roller, and the position of the wiper with respect to the roller may be adjusted by a bolt 38''. While I have described the pivotally mounted arm which carries the paint roller in considerable detail, yet it will be understood, of course, that the invention is in no manner limited to the particular structure illustrated and described, for it will be apparent that the paint carrying arm can be of any structure which will cause the roller to contact with the curved or in-

clined peripheral portion of the saucer or other article, at the proper angle, when the arm is swung about its pivot.

The paint reservoir, referred to by numeral 39, has a forwardly extending portion 39' in which the paint roller revolves. The saucer A or other article to be decorated, is rotated by the chuck 2, and the paint roller 38 is rotated by frictional contact with the article. Of course the roller rotates through the paint in the reservoir and applies it to the article to be banded. The reservoir is movable with the roller carrying arm, and is preferably removably attached to the arm by means of brackets 40 and 41.

Also carried by the roller carrying arm is a guide rail 42, which has the required curvature or angularity, and this guide rail cooperates with an abutment 44. This guide rail and cooperating abutment cause the paint roller to be moved toward and from the article to be decorated, in the particular path desired, as will be described more fully hereinafter. The abutment is preferably adjustable in any direction, as by means of a slot and screw connection 45.

After the article has been decorated, and has been released from the chuck by breaking the vacuum, it drops into a trough 46, down which it rolls by gravity to any desired point of disposal. The trough is so shaped that as the banded article rolls downward only the edge and back of the article touches the trough, as illustrated in dotted lines in Figure 1.

The operation of the apparatus will now be described briefly. In the specific form illustrated the chuck 2 is continuously rotated; the speed being regulated by the adjustment of the disc 11. And the frame 12 is continuously rocked by means of the continuously revolving cam 21; the number of revolutions of the cam per minute being regulated by the adjustment of the disc 18. In Fig. 1 the roller is on the low part of the cam and hence the frame is in its low position with the paint roller in contact with the article. For the purpose of this description let it be assumed that the roller is on the opposite side of the cam, so that the frame 12 is in its upper position and the paint roller 38 removed from the article, as shown in Figure 3. By particular reference to this figure, it will be noted that the oscillatable painting arm is held in its inoperative position by the guide rail 42 contacting with the abutment 44. When the paint applying mechanism moves forward, by reason of the downward rocking of the frame 12, the guide rail remains in contact with the abutment, but the rail is so shaped as to permit the painting arm to turn, under the influence of spring 34, about its pivot, so that the paint roller 38 approaches the inclined or curved peripheral portion of the article to be decorated, at the particular angle required, as illustrated in Figure 2. That is important in the banding of articles of this type, and the angle of approach can be varied to suit different articles, by adjusting the abutment 44 in any direction, or by changing the contour of the guide rail, or by such adjustments in combination with any of the various other adjustments heretofore mentioned. Also the position of the paint roller can be adjusted toward or away from the edge of the article, and of course for articles of larger or smaller diameter the rod 17 can be adjusted backward or forward in the rocking frame.

The cam 21 has rotated far enough to bring the paint roller into contact with the article

at the proper angle with respect thereto, but for various reasons such as irregularities in the article, it is desirable that the roller be resiliently held in contact with the article. The roller being in contact with the article it is obvious that a very slight further forward movement of the parts carries the guide rail 42 out of contact with the abutment 44, as clearly shown in Figure 2. The paint roller is now resiliently held against the article by the spring 34, so that good contact between the roller and article is assured, and the roller is free to follow any irregularities in the article. Of course the article A which is to be banded, and which is held in the chuck 2 by vacuum, is being rotated continuously, and the rotation of the article causes the paint roller to be rotated, thereby applying a band of paint to the article. As previously mentioned the lower portion of the roller travels in the paint in the reservoir 39; the reservoir being mounted on and movable with the painting arm.

When the paint roller 38 is in contact with the article to be banded, the roller 25 is in about the position on the cam 21 as shown in Figure 1. The duration of time the paint roller is in contact with the article can be varied by adjusting the split cam, as by means of bolts 21'.

The continued rotation of the cam causes the roller 25 to travel up the gradually inclined portion of the cam, thereby gradually drawing the paint roller 38 away from the banded article, to the position shown in Figure 3. The vacuum is now broken by the operation of the foot treadle 5, or by any other desired means, and the decorated article drops into the gravity trough 46, down which it rolls to any desired point of disposal; and while rolling down this trough the saucer, plate, bowl or other similar article is supported in the manner illustrated by dotted lines in Figure 1, so that the freshly applied band of paint is protected.

While I have described in detail the particular mechanism illustrated, yet it is apparent that many changes and modifications can be made without departing from the spirit of the invention, and all such changes and modifications are intended to be included within the scope of the appended claims.

What I claim is:

1. An apparatus for painting bands on saucers, bowls, plates and similar articles, including a pivotally mounted arm, a paint roller carried by the arm, means for advancing the arm and roller toward the article, and a guiding means for changing the direction of travel of the arm and roller during their approach, whereby the roller approaches the article at the desired angle.

2. An apparatus for painting bands on saucers, bowls, plates and similar articles, including a pivotally mounted arm, a paint roller carried by the arm, means for advancing the arm and roller toward the article, a guiding means for changing the direction of travel of the arm and roller during their approach, whereby the roller approaches the article at the desired angle, and means for adjusting the guiding means to vary the path of approach.

3. An apparatus for painting bands on saucers, bowls, plates and similar articles, including a pivotally mounted arm, a paint roller carried by the arm, a guide member for guiding the arm and roller through an indirect path into contact with the article at the desired angle, means for releasing the roller carrying arm from the guiding means, and means for resiliently maintaining the roller in contact with the article.

4. An apparatus for painting bands on saucers, bowls, plates and similar articles, including a pivotally mounted arm, a paint roller carried by the arm, means for advancing the arm and roller toward the article, a guide rail mounted on the arm, and a stationary abutment with which the guide rail cooperates to direct the roller through a predetermined path into contact with the article at the desired angle.

5. An apparatus for painting bands on saucers, bowls, plates and similar articles, including a pivotally mounted arm, a paint roller carried by the arm, means for advancing the arm and roller toward the article, a guide rail mounted on the arm, a stationary abutment, and means for resiliently maintaining the guide rail in contact with the abutment to guide the roller through a predetermined path into contact with the article at the desired angle.

6. An apparatus for painting bands on saucers, bowls, plates and similar articles, including a pivotally mounted arm, a paint roller carried by the arm, means for advancing the arm and roller toward the article, a guide rail mounted on the arm, a stationary abutment with which the guide rail cooperates to direct the roller through a predetermined path into contact with the article at the desired angle, and means for varying the angle of contact.

7. An apparatus for painting bands on saucers, bowls, plates and similar articles, including an arm, a paint roller and paint reservoir carried by the arm, means for causing the roller to travel through a predetermined path into contact with the article at the desired angle, means for resiliently maintaining the roller in contact with the article, and means for varying the time the roller is in contact with the article.

8. An apparatus for painting bands on saucers, bowls, plates and similar articles, including a chuck adapted to carry the article, means for rotating the chuck, an arm, a paint roller carried by the arm, means for causing the roller to travel through a predetermined path into contact with the article at the desired angle, means for varying the time the roller is in contact with the article, and means for varying the speed of rotation of the article.

9. An apparatus for painting bands on ceramic articles including a chuck, means for rotating the chuck, vacuum means for maintaining the article on the chuck, a paint roller, means for moving the roller into contact with the article, a gravity trough arranged below the article, said trough shaped to support the article in a rearwardly inclined position, and means for breaking the vacuum to drop the banded article into the trough.

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