May 10, 1960 S. AAMOT 2,935,963

STRIP-TINNING DEVICE

Filed May 3, 1957

FIG. 1

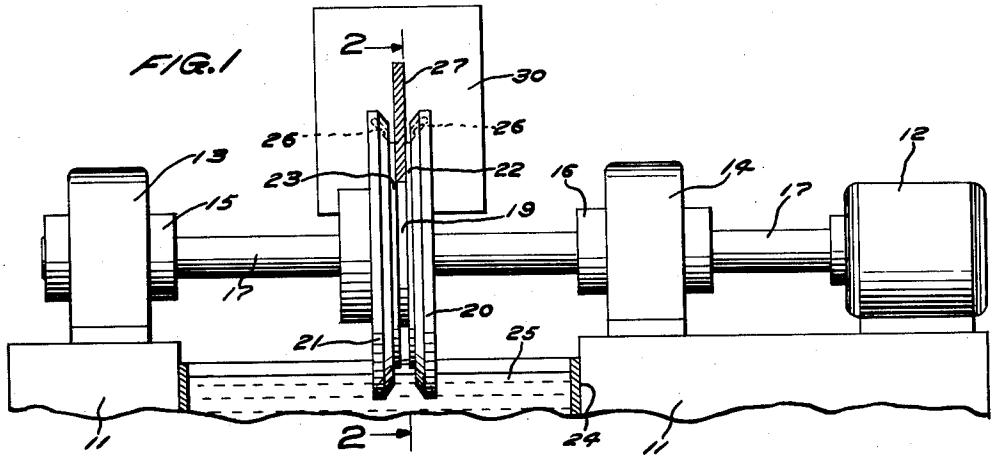


FIG. 2

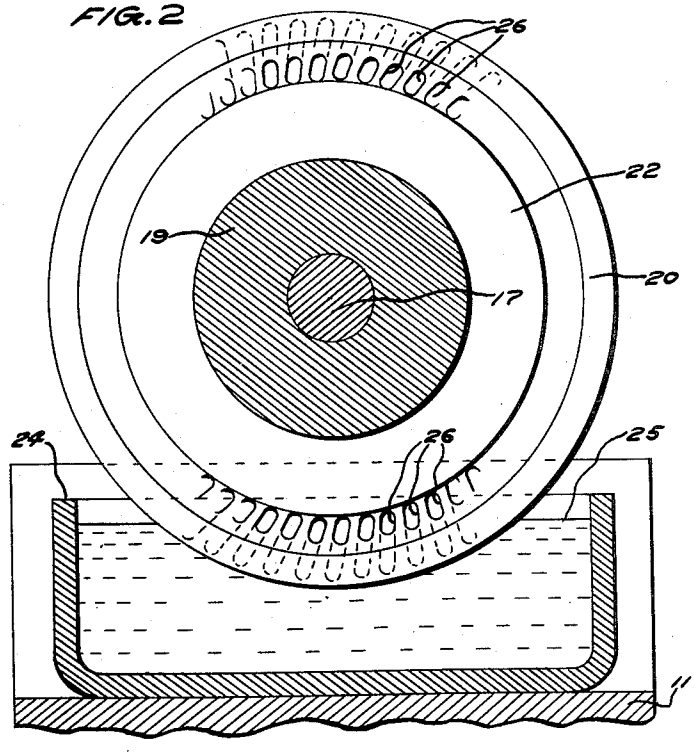
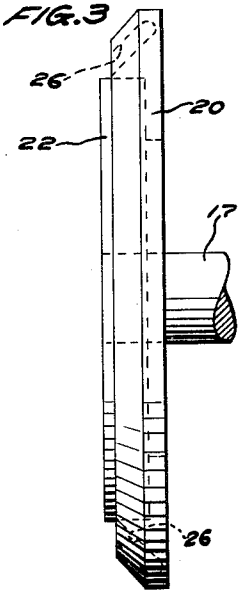


FIG. 3



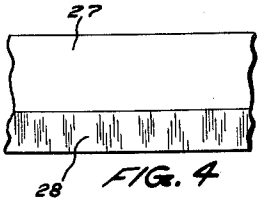


FIG. 4

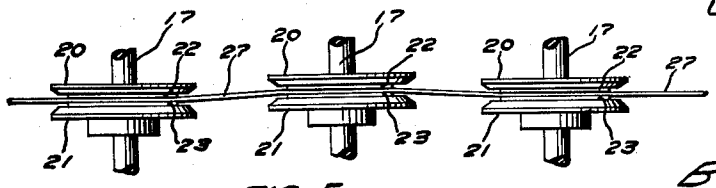


FIG. 5

INVENTOR
S. AAMOT
BY R. P. Miller
ATTORNEY

United States Patent Office 2,935,963 Patented May 10, 1960

2,935,963

STRIP-TINNING DEVICE

Sven Aamot, Downers Grove, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y., a corporation of New York

Application May 3, 1957, Serial No. 656,822

2 Claims. (Cl. 118—216)

This invention relates to strip-tinning devices and more particularly to devices having recessed applicator discs which lift molten tin from a container and apply it to a strip passing across the container.

A common device used in the past for applying tin to a strip is provided with a pair of smooth applicator discs which are rotated to lift molten tin from a container and apply it to a strip. One of the prime disadvantages of a device such as this is that the applicator discs must be positioned so deep in the tin that the shafts upon which the discs are mounted are completely submerged in the molten tin. In order to prevent tin from leaking out along the shafts where they pass through the sides of the container, an exceedingly tight packing is needed. This tight packing requires an excessive amount of power to rotate the applicator discs and results in excessive wear on the parts involved. With these problems in mind, a major object of this invention is to provide a strip-tinning device having applicator discs mounted on shafts which are not submerged in the molten tin.

Another object of this invention is to provide a strip-tinning device having applicator discs which are provided with recesses for lifting molten tin from a container and applying it to a strip passing above the container.

A further object of this invention is to provide a strip-tinning device having recessed discs which apply molten tin from a container to a strip moving above the container and which are rotated by the strip as it passes the container.

A still further object of this invention is to provide a strip-tinning device which cannot be rendered inoperative by the solidification of solder therein.

With these and other objects in mind, the present invention contemplates a pair of opposed rotatable applicator discs rigidly mounted on a shaft above a container of molten tin and between which a strip to be tinned is passed. The discs are provided with a plurality of recesses which lift molten tin from the container and apply it to the strip as it passes between the discs, the discs being rotated by the moving strip or by a drive motor.

Other objects and advantages of the invention will become apparent by reference to the following detailed description and the accompanying drawing illustrating a preferred embodiment of the invention, in which:

Fig. 1 is a fragmentary, partially sectioned front view of a strip-tinning device embodying the principles of the invention;

Fig. 2 is an enlarged cross-sectional view taken along line 2—2 of Fig. 1 showing the recesses in one of the applicator discs;

Fig. 3 is a side view of the applicator disc shown in Fig. 2 showing the manner in which the recesses in the discs are positioned and also showing one of the guide discs;

Fig. 4 is a fragmentary side view of the strip to which a zonal coating of tin has been applied; and

Fig. 5 is a reduced fragmentary plan view showing several pairs of applicator and guide discs so arranged that the moving strip rotates the discs.

Referring now in detail to the drawing, a base 11 is shown supporting a drive motor 12 (Fig. 1) and bushing housings 13 and 14. Bushings 15 and 16 in the housings 13 and 14 support a shaft 17 upon which is rigidly mounted a pair of applicator discs 20 and 21 secured to a pair of spaced guide discs 22 and 23 also rigidly mounted on the shaft 17, the guide discs being positioned in engagement with and on opposite sides of a collar 19. The collar 19 is rigidly secured to the shaft 17.

The diameter of the applicator discs 20 and 21 is such that the lowermost portions thereof extended downward from the shaft 17 beyond the guide discs and into a container 24 of molten tin 25 supported by the base 11. The discs 20 and 21 are provided with a plurality of generally cylindrical recesses 26 each of which extends from the plane surface of the disc at an angle of approximately 35°–40° (from the plane of the disc), and also at an angle of approximately 35°–40° from a plane passing through the axis of the shaft 17 and the open end of the recess 26. These recesses 26 in the discs 20 and 21 face each other and open into the side of the discs at points beyond the associated guide discs in the manner shown in Fig. 1.

A strip 27, to which a zonal layer or narrow band 28 (Fig. 4) of tin is to be applied, is positioned between the guide discs 22 and 23 and is moved between these discs by a take up mechanism 30 (Fig. 1) of a well-known type such as a capstan which advances the strip continuously.

In operation of the device, to apply a narrow layer 28 of tin to a strip 27, the strip is positioned between the guide discs 22 and 23, and the motor 12 and the strip take up mechanism 30 are actuated. The applicator discs are rotated in a predetermined counterclockwise direction so that the open ends of the recesses lead the closed ends. As the strip 27 passes between the rotating discs, molten tin is picked up from the container 24 by the recesses 26 in the discs 20 and 21 and is carried upward. The filling of the recesses is assured because the openings in the recesses lead the closed ends. As the tin carrying recesses 26 approach their uppermost positions, the tin is spilled therefrom and flows over the guide discs 22 and 23 and the lower portion of the strip 27 to apply a zonal layer 28 of tin of uniform width thereto.

If it is desirable, a plurality of pairs of discs 20 and 21 may be mounted in tandem on separate shafts, alternate pairs of discs being offset laterally from the path of travel of the strip 27 (Fig. 5). If this system is used, the moving strip 27 will drag sufficiently on the discs 20 and 21 to rotate them, thereby rendering it unnecessary to use motors for driving the discs.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of this invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A device for tinning a strip, comprising a base, a container of molten metal on the base, a shaft rotatably mounted on the base and extending across the container, a collar rigidly secured to the shaft above the container for engaging and supporting a strip to be tinned, a pair of guide discs rigidly attached to the shaft on opposite sides of the collar for engaging opposite sides of and guiding the strip, a pair of applicator discs rigidly secured to the outer sides of the guide discs and extending radially beyond said guide discs into the molten metal in the con-

tainer, and means for rotating the shaft and applicator discs in a predetermined direction, each of said applicator discs having a plurality of evenly spaced cylindrical recesses, each recess opening into the side of the applicator disc beyond its associated guide disc and extending outwardly and away from said associated guide disc to terminate in the vicinity of the periphery of the applicator disc, each of said recesses being disposed at an acute angle with respect to the plane of the applicator disc, each recess also being disposed at an acute angle toward said predetermined direction of rotation whereby the recesses are so disposed in the applicator discs that when the recesses are moved in the container the openings will lead the closed ends of the recesses to insure the filling of the recesses with molten metal.

2. In a device for coating a strip of material, a container of fluid, a pair of spaced applicator discs, means for rotatably supporting said discs to extend partially into said container, means for guiding the strip to move in a horizontal path above the axis of the applicator discs,

each of said applicator discs having cylindrical recesses formed therein extending outwardly at acute angles from the facing sides of the discs toward the peripheries of the discs, each of said cylindrical recesses also extending at an acute angle in the plane of the disc with respect to a radius passing through each recess, and means for rotating said applicator discs in a predetermined direction so that the open ends of the recesses lead the closed ends whereby each recess is filled as it passes through said container and is discharged as it approaches the horizontal path of the strip.

References Cited in the file of this patent

UNITED STATES PATENTS

1,416,773	Barbour et al.	May 23, 1922
1,496,309	Girvin	June 3, 1924
2,213,670	Greene	Sept. 3, 1940

FOREIGN PATENTS

747,453	Great Britain	Apr. 4, 1956