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ORIENTING APPARATUS FOR ARTICLES HAVING ROUNDED SURFACES

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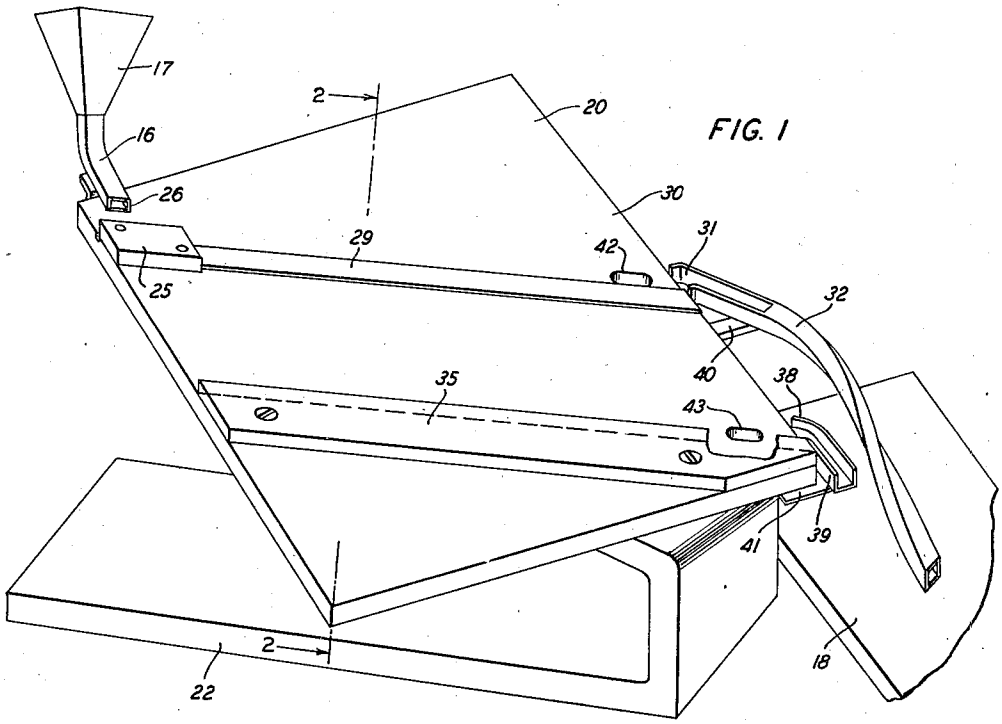
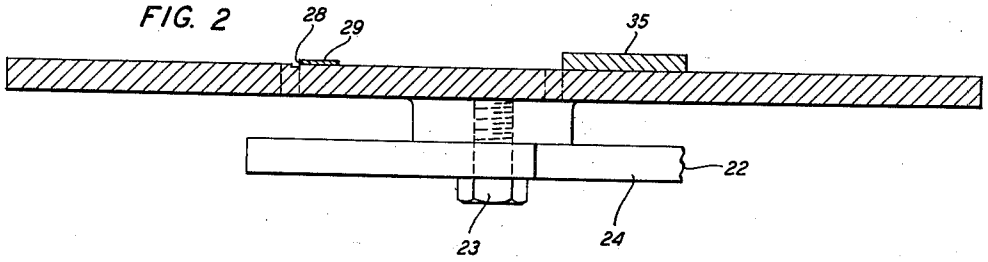


FIG. 1

FIG. 2



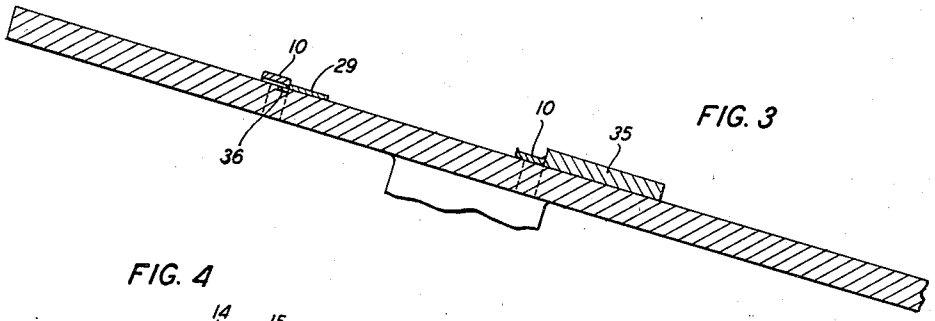
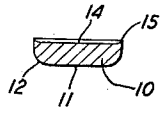


FIG. 3

FIG. 4



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ORIENTING APPARATUS FOR ARTICLES HAVING ROUNDED SURFACES

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2 Claims. (Cl. 209—72)

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This invention relates to article handling apparatus, and more particularly to apparatus for orienting articles.

In the manufacture of electrical units commercially known as copper oxide rectifiers, copper discs for certain of these units are produced by a punch press, leaving one surface of each disc slightly cupped and the other rounded. These discs vary in size, some of them being as small as one-sixteenth of an inch ($\frac{1}{16}$") in diameter, and it is necessary during the processing of these articles or discs that their similar surfaces face the same way to receive their coatings.

An object of the invention is to provide an apparatus which is simple in structure and highly efficient in orienting articles.

With this and other objects in view, the invention comprises an apparatus for orienting articles having opposing rounded and cupped surfaces, the apparatus including a table, to singly receive the articles, with raised portions of different heights to respectively direct the articles in different positions toward their respective chutes, one of the chutes being twisted to invert the articles received thereby and direct them in the same position with the articles from the other chute onto a tray.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing, wherein

Fig. 1 is a perspective view of the apparatus;

Fig. 2 is an enlarged sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view of the table showing the posiitons of the articles thereon; and

Fig. 4 is an enlarged sectional view of one of the articles.

Referring now to the drawing, attention is first directed to an article indicated at 10 in Fig. 4 and enlarged to illustrate more accurately the contour thereof. When such articles are produced by a punch press, one surface 11 is provided with rounded edges 12, while another surface 14 may be flat throughout or substantially cup-shaped, that is, being provided with fins 15 at its periphery. In the present embodiment the latter example is shown. Realizing these features of the article, the apparatus was constructed so that the successive articles received from a supply means such as a chute 16 (Fig. 1) connected with a hopper 17, may be directed in such a manner that eventually they will be disposed in a single layer upon a tray 18 with all of their cup-shaped surfaces upwardly, as illustrated in

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Fig. 4. A table 20 of the cross-sectional contour illustrated in Figs. 2 and 3 is supported by an element or bracket 22 of the contour illustrated in Fig. 1 and secured to the bracket through the aid of a screw 23. An upper portion or arm 24 of the bracket 22 extends at an angle with respect to its horizontal base portion thereof so as to position the table 20 at a given angle, the purpose of this being to cause the article 10 to travel thereon by the aid of gravity.

An abutment 25, positioned in front of an outlet 26 of the chute 16, interrupts the downward travel of the articles passing outwardly from the chute to cause them to travel against a shoulder 28 of a raised portion or member 29. The member 29, as illustrated in Fig. 1, extends to a far edge 30 of the table diagonally from a position short of the upper corner thereof to a mouth 31 of a chute 32. The height of the member 29 is sufficient to direct all articles having their surfaces 14 downwardly to the chute 32, but not of sufficient height to retain the articles moving on their surfaces 11. The last mentioned articles in their travel, due to their rounded edges 12, will ride over the member 29 and continue their downward movement on the table to a member 35. Returning again to the member 29, attention is directed to a groove 36 which extends diagonally across the table in front of the abutment 25 and the member 29 to receive any foreign articles, which may pass onto the table with the articles or collect thereon, from interfering with the function of the member 29 in directing the articles. Without the groove 36 a collection of foreign particles might build up a rounded surface to cause all articles to pass over the member 29 and onto the member 35.

The member 35 is of greater thickness than the member 29, and extends substantially parallel therewith across the table 20 to direct all articles 10 which have passed over the member 29, these articles having their surfaces 11 downwardly, to a mouth 38 of a chute 39.

The chutes 32 and 39 are supported in any suitable manner, such as by the aid of brackets 41 fixed to the table 20, and positioned with their outlets substantially in a common plane although at different positions, so that their respective articles may be laid upon the tray 18, the latter being supported by any suitable means (not shown). The chute 32 is given a one hundred and eighty degree (180°) twist between its mouth 31 and its outlet so as to turn completely over all articles received thereby from the member 29.

Outlets 42 and 43, in the form of elongate nar-

row apertures, are disposed in the table 20 adjacent the chutes 32 and 39 for the ejection of defective or incomplete articles which may accidentally be included with the articles when fed to the table through the chute 16. The outlets 42 and 43 are not of sufficient width to allow the perfect articles or discs 10 to escape therethrough, but any article smaller than the complete discs, such as those resulting from overlapped punchings, will be ejected from the table through these outlets before they reach the chutes 32 and 39. This is also due to the fact that the articles or discs roll down the shoulder 28 and with the defective articles their smaller dimensions, upon reaching the outlets, will cause them to drop therethrough.

During the feeding of the articles 10 singly through the aid of the hopper 17 or other suitable means and the chute 16, to the table the articles will first strike the abutment 25 and start their travel diagonally across the table guided by the member 29. Those articles having their cup-shaped surfaces 14 downwardly will continue their travel directed by the member 29 due to the engagement of the fin-like edges 15 with the shoulder 28 of the member, until they enter the mouth 31 of the chute 32, after which their travel is controlled by the chute, they being turned so that they will eventually pass onto the tray 18 with their surfaces 14 upwardly. The other articles, namely those having their rounded edges 12 downwardly, will in their circular motion in rolling down the adjacent surface of the abutment 25 and the beginning of the shoulder 28, ride over the member 29 due to the momentum of the articles aided by their weight and by gravity controlled by the angular position of the table, and eventually continue their downward movement on the table until they strike the member 35. The last mentioned articles will thus be under the control of the member 35, continuing their downward and diagonal movements until they enter the mouth 38 of the chute 39, to then be guided by the chute to the tray 18. The speed of travel of the articles may be varied by varying the positions of the members 29 and 35. This variation, of course, must be brought about by an adjustment of the table relative to the diagonal arm 24 of the supporting bracket 22. Furthermore, the speed in which the articles are fed to the table depends upon the slope of the controlling surfaces or shoulders of the members 29 and 35, as the articles will travel faster along the diagonal controlling surfaces of the members 29 and 35 as these surfaces approach a substantially vertical position.

It will, therefore, be apparent that the articles being fed singly to the table will be divided into two series, one with the fins 15 facing downwardly, the other with the fins facing upwardly, the separation of these series of articles occurring during their downward travel on the table. The series of articles enter their respective chutes where one continues to travel in its original position, with its fins or projections upwardly, while the other series of articles is inverted or turned over to position their fins or projections upwardly.

Although specific improvements of the invention have been shown and described, it will be understood that they are but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention as defined by the appended claims.

What is claimed is:

1. An apparatus for orienting articles, each having a surface with a rounded edge, the apparatus comprising a stationary table, means to feed the articles successively to the upper surface of the table, means to support the table with its upper surface slanting in a given direction to cause the articles to move downwardly thereon, a separating member of a given uniform thickness fixedly mounted upon the table and slanting downwardly longitudinally in a direction transversely of the given direction of slant of the table to direct the articles, with their round edge surfaces extending upwardly, off the table separate from the other articles, the latter sliding over the said member in their movement down the table, and means for use in varying the position of the table relative to the supporting means to vary the degree of slant of the said member without varying the degree of slant of the table to vary the speed of travel of the articles relative thereto.

2. An apparatus for orienting articles, each having a surface with a rounded edge, the apparatus comprising a table with a diagonally extending groove in its upper surface, means to support the table with its upper surface slanting in a given direction to cause the articles to move downwardly thereon, and a separating member of a given uniform thickness fixedly mounted upon the table with an article controlling edge thereof disposed adjacent the said groove and slanting downwardly with the groove in a direction transversely of the given direction of slant of the table to direct the articles, with their round edge surfaces extending upwardly, off the table separate from the other atricles, the latter sliding over the groove and member in their movement down the table.

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