

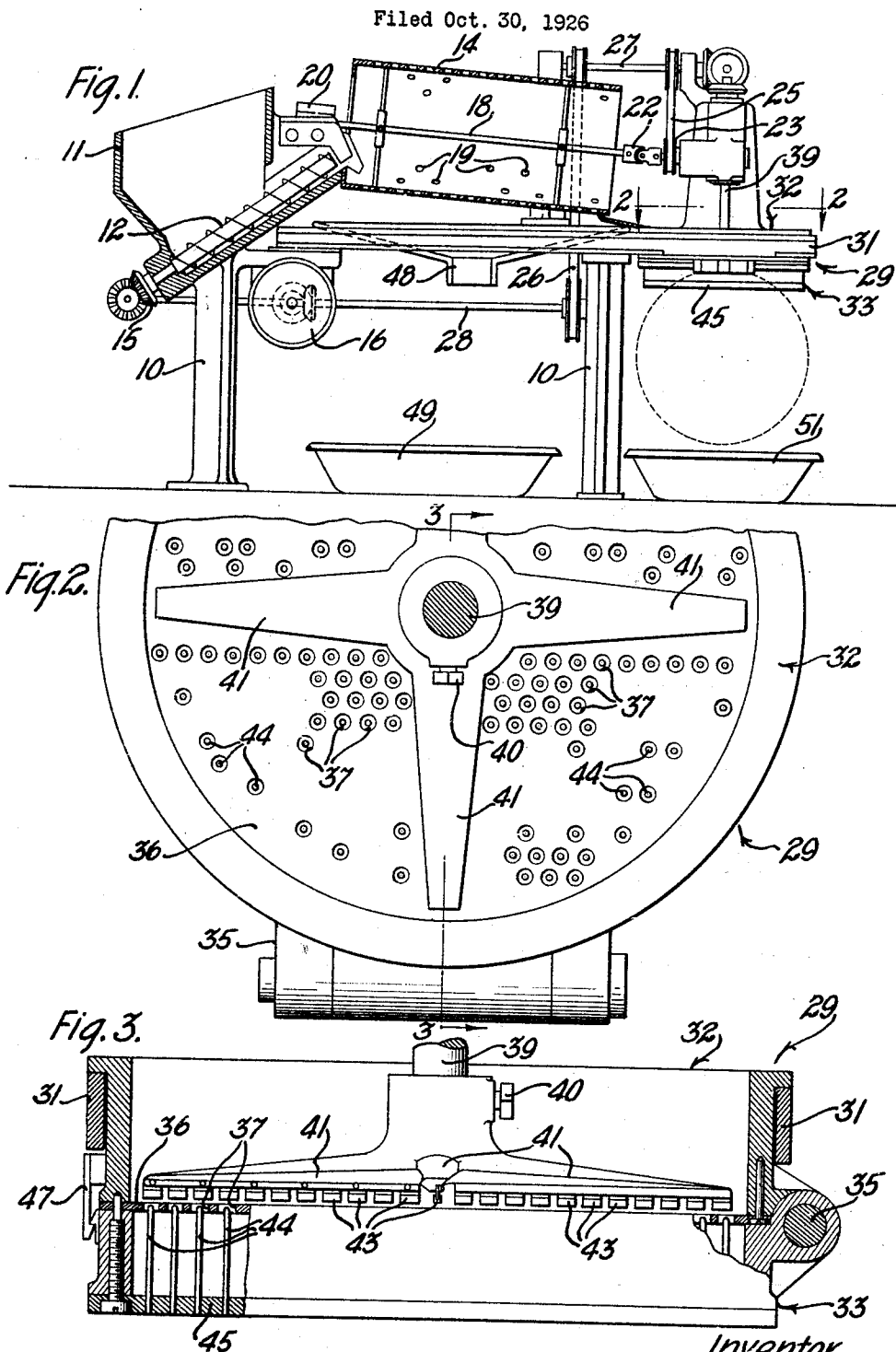
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ARTICLE SORTING APPARATUS

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UNITED STATES PATENT OFFICE.

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ARTICLE-SORTING APPARATUS.

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This invention relates to article sorting apparatus, and more particularly to apparatus for sorting nut blanks and the like.

In the process of machining certain classes of apertured articles, it is essential in some instances that these articles meet certain specified requirements as to exterior size and contour as well as to the location of the apertures therein in order to facilitate the completion of the machining operations. Thus, for example, in the process of producing machine nuts, it is essential that the aperture formed in each blank be centrally located and the exterior size or other characteristic thereof be in accordance with certain requirements to facilitate the tapping thereof. It is the practice in some instances to mechanically or manually select nut blanks from a supply thereof and introduce them into a tapping machine and in the event that the blanks thus selected have not been sorted so as to include only those which meet specified requirements, the introduction of an imperfect blank may result. The presence of an imperfect nut blank, such as one with an imperfectly formed aperture, may cause the tap in the machine to be subjected to deleterious strains.

The primary object of this invention is to provide a simple and durable apparatus for quickly and efficiently sorting apertured articles.

In accordance with the general features of the invention, one embodiment thereof comprises an apparatus wherein nut blanks are fed from a supply hopper to a rotating drum having apertures through which blanks below a specified size are discharged while the remaining blanks are deposited upon a horizontal receiving plate. These selected blanks are swept in a circular path and oriented by resilient members carried by rotating arms over a plurality of openings in the plate and centrally positioned over vertical pins, those blanks of the desired size and contour and having apertures of predetermined size and location selectively passing through the openings and being threaded upon the pins.

These and other objects will be apparent from the following detailed description and the accompanying drawings, in which

Fig. 1 is an elevational view of a sorting machine assembly shown partly in section, which is representative of one embodiment of the invention;

Fig. 2 is a fragmentary detailed sectional view of the sorting mechanism taken on the line 2—2 of Fig. 1, and

Fig. 3 is a transverse vertical section of the sorting mechanism taken on the line 3—3 of Fig. 2, certain parts thereof being shown in elevation.

Referring now to the drawings wherein like numerals have been employed to designate similar parts through the various figures, it will be observed that this improved sorting machine comprises a suitable machine base or frame 10 (Fig. 1). Mounted at one extremity of the base 10 is a hopper 11 and positioned within the hopper is a screw conveyor 12 which is adapted to convey nut blanks from within the hopper 11 to a rotatable, perforated drum 14. The screw conveyor 12 carries a beveled gear 15 at its lower extremity which is operatively connected by means of suitable elements to a driving motor 16 which is supported by the upper portion of the frame 10.

The drum 14 which is supported by a rotatable shaft 18 slightly inclined from the horizontal is provided with perforations 19 which will permit nut blanks below a certain specified exterior size to be discharged therethrough during the rotation of the drum. One extremity of the shaft 18 is mounted in a suitable bearing 20 on the hopper 11 and the other extremity thereof has a universal coupling 22 connected with a pulley 23 which is operatively connected with the motor 16 through belts 25 and 26 and shafts 27 and 28. The nut blanks which are not discharged through the perforations 19 are conveyed within the drum 14 to a sorting mechanism denoted generally by the numeral 29.

This sorting mechanism 29 which is carried by a support 31 mounted upon the frame 10 comprises an upper fixed cylindrical section 32 and a lower section 33 which is hinged to the fixed section 32 at 35. Secured to the lower portion of the fixed section 32 is a horizontally disposed receiving plate 36 which is provided with a plurality of spaced openings 37. These openings are sufficient in size to permit nut blanks having a specified exterior size and contour to be discharged by gravity when carried into registration therewith.

Positioned within the section 32 and secured to the lower end of a vertical, rotatable shaft 39 by means of a set screw 40 is a mem-

ber provided with radial arms 41, the lower surfaces of which are in parallelism with and in proximity to the upper surface of the receiving plate 36. Secured to and spaced along the underside of each of the arms 41 are a plurality of depending members 43 which are preferably constructed of a firm, yet resilient material, such as rubber, leather or the like. The lower portions of these depending members 43 terminate immediately adjacent the upper surface of the receiving plate 36 and serve to engage with and orient nut blanks indiscriminately associated with the receiving plate 36 from the drum 14.

A plurality of vertically disposed pins 44 are secured at their lower extremities to a base plate 45 which forms the bottom of the hinged section 33. When the hinged section 33 is swung to its uppermost position as clearly shown in Fig. 3, it will be locked in position by means of a spring latch 47, and the upper extremities of each of the pins 44 will be positioned centrally with respect to a companion opening 37 in the receiving plate 36. The upper ends of the pins 44 will terminate slightly below the upper surface of the plate 36, and it is to be understood that when a properly apertured nut blank is carried into registration with one of the openings 37, it will be displaced therethrough by gravity and threaded upon a companion pin 44. The pins 44 are designed to permit the threading thereon of nut blanks having apertures which are centrally positioned and are of proper size. Rotation is imparted to the arms 41 through the shaft 39 which is operatively connected with the shaft 27 (Fig. 1).

In the operation of the machine nut blanks are indiscriminately placed within the hopper 11 and rotation is imparted to the screw conveyor 12 and the drum 14 through the medium of the driving motor 16. Nut blanks which are below a certain required exterior size are discharged through the perforations 19 and subsequently deposited within a receiving chute 48 which serves to direct the discharged blanks to a pan 49. Due to the inclination of the drum 14 the remaining blanks are conveyed to and indiscriminately deposited upon the receiving plate 36 of the sorting mechanism 29. The continual rotation of the arms 41 causes the depending members 43 thereon to engage with and orient the blanks associated with the plate 36 in such a manner that the blanks will eventually be carried into registration with the openings 37. Blanks which meet the requirements as to exterior size and contour when carried into registration with the openings 37 will be discharged therethrough and threaded upon a companion pin 44 if the blanks are properly apertured. In the event that a blank should meet the external requirements as to size and contour but not be formed with an aperture or if an aperture in the blank is not centrally lo-

cated, the pins 44 will prevent the discharge thereof through the openings 37. To remove the sorted nut blanks which are threaded upon the pins 44, it is only necessary to release the latch 47, thereby permitting the section 33 to be swung downwardly in the position shown by dotted lines (Fig. 1). The nut blanks may then be removed from their respective pins and deposited into a receiving tray 51. The imperfect blanks remaining within the fixed section 32 may be removed from time to time and the sorted blanks within the tray 51 may be mechanically or manually introduced within a tapping machine. The dangers incident to the introduction of imperfect blanks are positively precluded by selecting blanks from a supply comprised of blanks which have been sorted in the manner described.

Although the invention as herein disclosed has been described in connection with apparatus for sorting nut blanks, it is to be understood that the invention is capable of many other applications which are limited only by the scope of the appended claims.

What is claimed is:

1. In apparatus for sorting apertured articles, an article receiving means provided with an opening to permit the discharge thereof of an article having a predetermined exterior characteristic, means for causing relative rotary movement between the receiving means and an article associated therewith, and means positioned within the opening for preventing imperforate articles from passing through the opening in the receiving means.
2. In apparatus for sorting apertured articles, an article receiving means, means provided with a plurality of openings to permit the discharge thereof of articles having a predetermined exterior size and contour, means for causing relative rotary movement between the receiving means and associated articles, and means positioned within each opening to prevent the discharge thereof of improperly apertured articles.
3. In apparatus for sorting apertured articles, an article receiving plate provided with openings to permit the discharge thereof of articles having a predetermined exterior characteristic, a rotary means for orienting the articles associated with the receiving means, and means positioned within each opening to prevent the discharge thereof of improperly apertured articles.
4. In apparatus for sorting articles, an article receiving means provided with a plurality of openings to permit the discharge thereof of articles having a predetermined exterior characteristic, means for supplying articles to the receiving means, a rotary means for orienting the articles associated with the receiving means, and a pin associated with each opening to receive properly apertured articles discharged from the receiving means.

5 5. In apparatus for sorting apertured articles, an article receiving plate, provided with an opening to permit the discharge therethrough of an article having a predetermined exterior characteristic, a rotary means
10 for moving the article over the receiving plate, and a pin mounted beneath the plate and positioned within the opening to receive properly apertured articles and prevent the
15 discharge through the opening of improperly apertured articles.

6. In apparatus for sorting apertured articles, an article receiving plate provided with an opening to permit the discharge there-
15 through of an article having a predetermined characteristic, means for causing a relative movement between the plate and an article thereon, a pin cooperating with the opening
20 to receive properly apertured articles and to prevent the discharge through the opening of improperly apertured articles and a mounting therefor pivoted to move the pin from its
25 article receiving position within the opening to a discharge position.

7. In apparatus for sorting apertured articles, an article receiving plate provided with a plurality of openings to permit the discharge therethrough of articles having a pre-

determined exterior characteristic, means for causing a relative movement between the 30 plate and the articles thereon, a pin cooperating with each opening to receive properly apertured articles and prevent the discharge through the opening of improperly apertured
35 articles, and a common mounting for the pins pivoted to simultaneously move the pins from their article receiving positions within the openings to article discharge positions.

8. In apparatus for sorting apertured articles, a drum having an apertured wall and ro- 40 tatable on an inclined axis for receiving at the upper end thereof differently apertured articles of different sizes and selectively discharging from the drum articles of less than a pre-
45 determined size through the apertures as the articles travel along the inclined wall of the drum, means for rotating the drum, means for receiving the remaining articles from the lower end of the drum, and means for selectively
50 discharging therefrom properly apertured articles of a predetermined size.

In witness whereof, I hereunto subscribe my name this 22nd day of October, A. D. 1926.

RUDOLPH ANTHONY SKRIBA.