

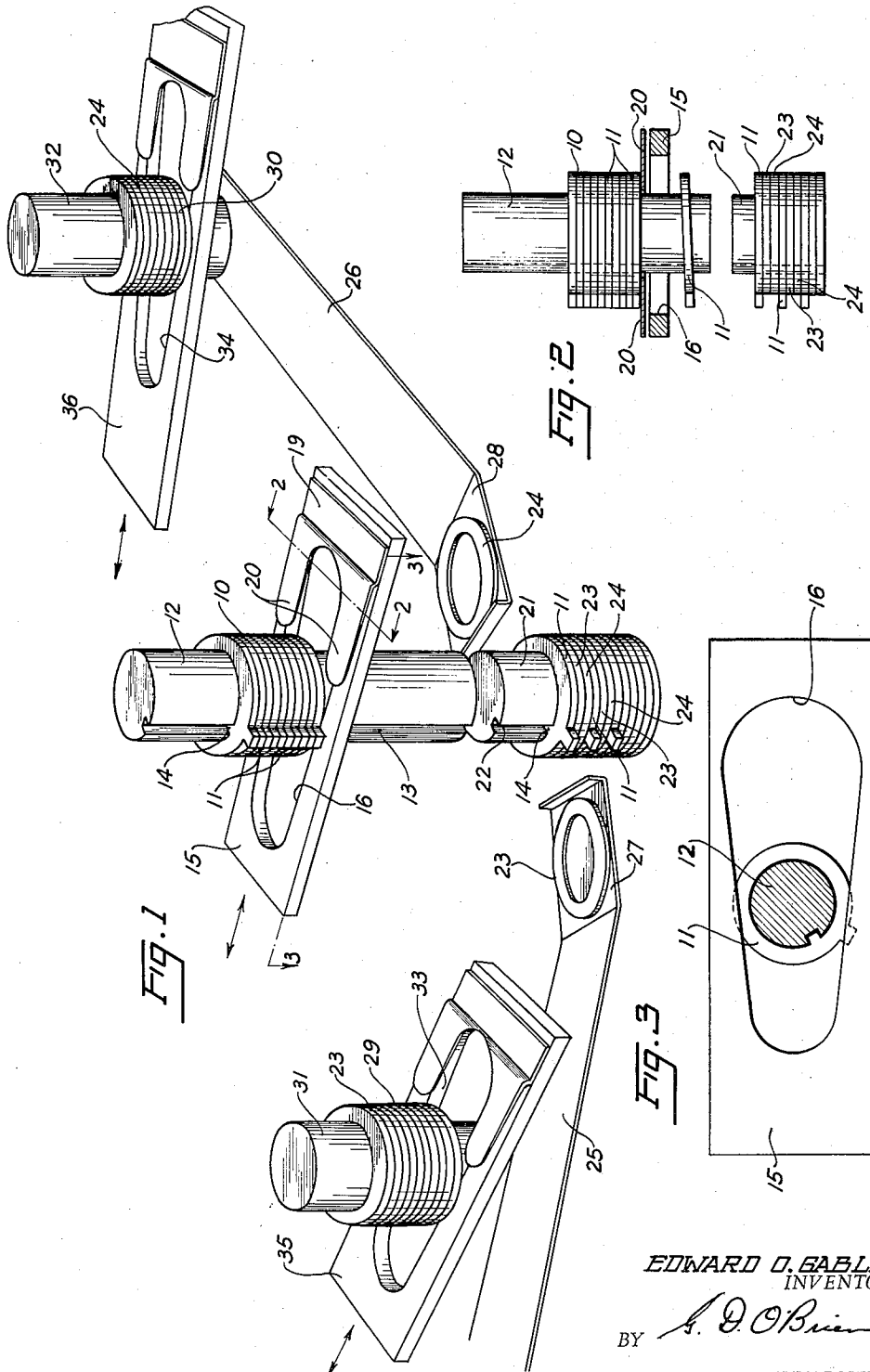
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DEVICE FOR DISPENSING APERTURED PLATES

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ATTORNEYS

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DEVICE FOR DISPENSING APERTURED PLATES

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1 Claim. (Cl. 214—8)

This invention relates to apparatus for mechanically feeding individual pieces from a stack of pieces, especially pieces whose orientation is critical.

It is frequently desirable when assembling discs, insulators, spacers, washers, battery plates, or similar thin component parts into a unit consisting of an orderly pile of such elements that the pieces be fed at predetermined intervals and properly oriented. Batteries, armatures, and rectifiers are often built up of alternate layers of such pieces assembled on a mandrel, shaft, spindle or other support. If the component parts are properly oriented and are fed in the proper sequence such an operation can be entirely automatic. If three or more different types of such pieces are to be assembled manually on a spindle, the operation can be speeded up considerably by providing manual assembly of only two types of component parts and feeding the remaining types automatically at desired intervals. If such semi-automatic operation is adopted, a worker has only one type of piece to manipulate with each hand, and both saving in time and increase in efficiency will result.

It is an object of this invention to provide a mechanism for automatically dispensing individual pieces at predetermined intervals from a stack of pieces.

Another object of this invention is to provide apparatus to mechanically feed thin and fragile pieces free from difficulties frequently encountered in the past in that manual assembly of fragile parts is often difficult to perform, time consuming, and wasteful of material because of wrinkling and crushing of the parts.

The invention consists essentially of a particular mechanism for holding a stack of apertured plates and for feeding these plates one at a time onto a mandrel with the plates properly oriented and in proper sequence.

Other objects and advantages of this invention and the novel mechanical details thereof will be apparent from the following specification and the accompanying drawing wherein:

Fig. 1 is a view in perspective of one embodiment of the invention wherein preoriented plates are automatically dispensed onto a mandrel and individual spacers are automatically fed to the right and left hands of an operator for manual insertion onto the mandrel;

Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1; and

Fig. 3 is a horizontal sectional view on line 3—3 of Fig. 1.

In carrying the invention into effect in a preferred embodiment thereof as shown in Fig. 1, two types of parts are automatically fed at predetermined intervals within easy grasp of the right and left hands of an operator for manual assembly onto a mandrel and a third type of part is automatically fed in proper orientation and at desired intervals onto the mandrel. A stack 10 of disc-shaped battery plates 11 is mounted on a vertical rod 12 having a splineway 13 cut along the exterior periphery parallel to the axis of the rod 12. The plates 11 are blanked with ribs 14 which operate in the splineway 13 to keep

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the plates 11 in proper orientation on the rod 12. A flat horizontal slide 15 mounted for reciprocation transversely of the axis of the rod 12 is formed with a variable-width slot 16 through which the rod 12 extends.

The slot 16 is elongated in the direction of reciprocation and has a radius at its narrower end smaller than the radius of the plates 11 (best shown in Fig. 3) to prevent the passage of the latter through the narrower portion of the slot 16 when the rod 12 approaches the narrower end. The radius at the opposite end of the slot 16 is greater than the radius of the plates 11 to permit their passage when the stack 10 is in register with the wider portion of the slot 16. The slide 15 supports the stack 10 of plates 11 during the greater portion of its travel and prevents movement of the plates 11 down the vertical rod 12 except when the slide 15 moves to bring the wider end of the slot 16 near the rod 12 and thus bring the stack 10 into registry with the wider portion of the slot 16.

A flat bifurcated separating plate 19 having a separation between the fingers 20 at the bifurcated and narrower than the outside diameter of the plates 11 but wider than the diameter of the rod 12 is conveniently constructed of material thinner than the thickness of a single plate 11. The fingers 20 at the bifurcated end of the separating plate 19 are provided with relatively sharp edges and extend at least partly over the wider end of the elongated slot 16 but not over the narrower end. The separating plate 19 at the end opposite the bifurcation is attached to the top of the slide 15 with the sharp fingers 20 approximately at the height of one plate 11 above the slide 15. The slide 15 supports the stack 10 during the greater portion of its travel. As the slide 15 travels to move the wider end of the slot 16 adjacent the rod 12, the sharp fingers 20 of the separating plate 19 disengage a single plate 11 from the stack 10 and afford a partial support for the remainder of the stack. When the wider portion of the slot 16 is moved into registry with the stack 10 the fingers 20 afford the sole support for the remainder of the stack 10, at which time the disengaged plate 11 is fed by gravity down the rod 12 onto a vertical mandrel 21. The mandrel 21 is of substantially the same diameter as the rod 12 and is positioned in coaxial relation with and a short distance below the rod 12. A separation is provided between the mandrel 21 and the rod 12 to allow manual insertion of spacers 23 and 24 onto the mandrel 21 between successive plates 11. The mandrel 21 is oriented so that a splineway 22 provided in the exterior periphery thereof is in alignment with the splineway 13 in the rod 12. The rib 14 of the plates 11 operating in the splineways 13 and 22 will maintain the plates 11 properly oriented as they are fed by gravity down the rod 12 and onto the mandrel 21 after disengagement from the remainder of the stack 10. The plates 11 are thus loaded onto the mandrel 21 in proper orientation, and the interval at which the plates are fed can be regulated by varying the speed of reciprocation of the slide 15. The number of plates 11 to be disengaged from the stack 10 during each cycle of reciprocation of the slide 15 can be varied by regulating the height of the fingers 20 of the separator plate 19 above the slide 15.

The apparatus illustrated in the preferred embodiment of the invention shown in Fig. 1 has been constructed to automatically feed individual annular spacers 23 and 24 onto platforms 27 and 28 for manual insertion of said spacers 23 and 24 onto the mandrel 21 between successive plates 11. As the spacers 23 and 24 are not oriented in the final battery assembly, they are dispensed individually by the apparatus at points remote from the operator to be gravity-fed down inclines 25 and 26 onto platforms 27 and 28 which are within easy reach of the oper-

ator. Stacks 29 and 30 of spacers 23 and 24 are manually loaded onto vertical rods 31 and 32 respectively, and the individual spacers are automatically dispensed through slots 33 and 34 in reciprocating slides 35 and 36 respectively in exactly the same manner that the plates 11 are fed through slot 16 in slide 15 as described above. The intervals at which the spacers 23 and 24 are fed can be regulated by varying the speed of reciprocation of the slides 35 and 36. In the assembling of the battery unit as depicted in Fig. 1, a single spacer 23 and a single spacer 24 are inserted between successive plates 11, and it is convenient to operate the three slides 15, 35, and 36 in unison with a sufficient interval between cycles to allow manual insertion of the spacers 23 and 24 onto the mandrel 21.

In Fig. 2 a single plate 11 is shown passing through the wider portion of the slot 16 after it has been disengaged from the remainder of the stack 10 which is supported by the fingers 20 of the separating plate 19. After the slide 15 has traveled far enough to remove the fingers 20 of the separating plate 19 from beneath the stack 10, the slide 15 affords the sole support for the stack 10 during the remainder of the cycle.

It will be recognized that the apparatus specifically described herein for carrying out the invention is susceptible of considerable modification and rearrangement without departing from the spirit of the invention, the scope of which is pointed out in the appended claim.

What I claim as new and desire to secure by Letters Patent of the United States is:

Assembly apparatus for apertured members some with circular apertures and some with noncircular aper-

tures, comprising support members constituting right and left stations convenient to the right and left hands of an operator, means for feeding circular apertured members one at a time to said right and said left hand stations, a noncircular mandrel rod between the two stations with a cross section smaller than the circular and noncircular apertures and rotation-preventively fitting the noncircular apertures, a fixed vertical rod in axial alignment with and spaced from the mandrel rod sufficient to allow hand insertion of circular apertured members on the top of the mandrel rod and still close enough to allow properly oriented noncircular apertured members from the fixed rod to fall still so oriented onto said mandrel rod, said fixed rod having a noncircular cross section rotation-preventively fitting the noncircular apertures oriented in alignment with the cross section of said mandrel rod, a reciprocating horizontal slide having an elongated slot wider at one end than the outside diameter of said noncircular apertured members and at the other end narrower than said outside diameter but wider than said fixed rod, said fixed rod extending vertically through said slot in said slide, and means movable with said slide and spaced therefrom for separating a predetermined number of noncircular apertured members and for supporting the remainder of said noncircular apertured members when said fixed rod is in the wider portion of said slot.

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