July 9, 1963 P. CHIAIA 3,096,603

AUTOMATIC COUNTING MACHINE FOR SCREWS, NAILS AND SIMILAR ARTICLES

Filed April 25, 1960 3 Sheets-Sheet 1

Fig. 1

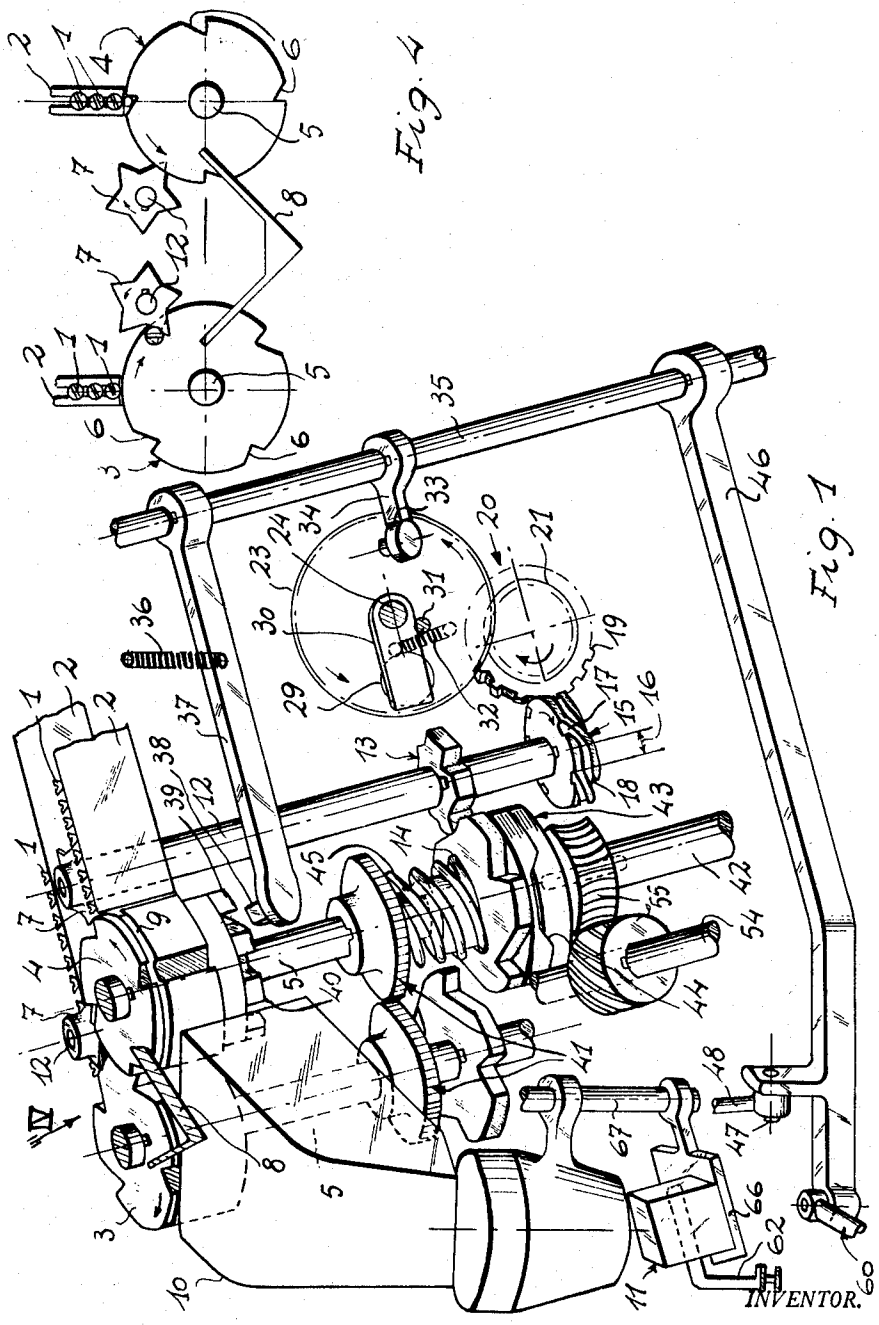

Fig. 2

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AUTOMATIC COUNTING MACHINE FOR SCREWS, NAILS AND SIMILAR ARTICLES

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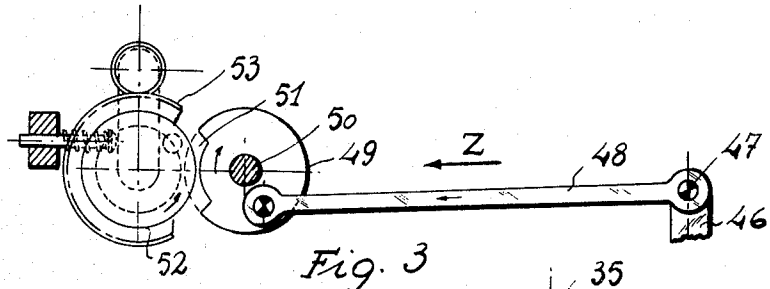

Fig. 3

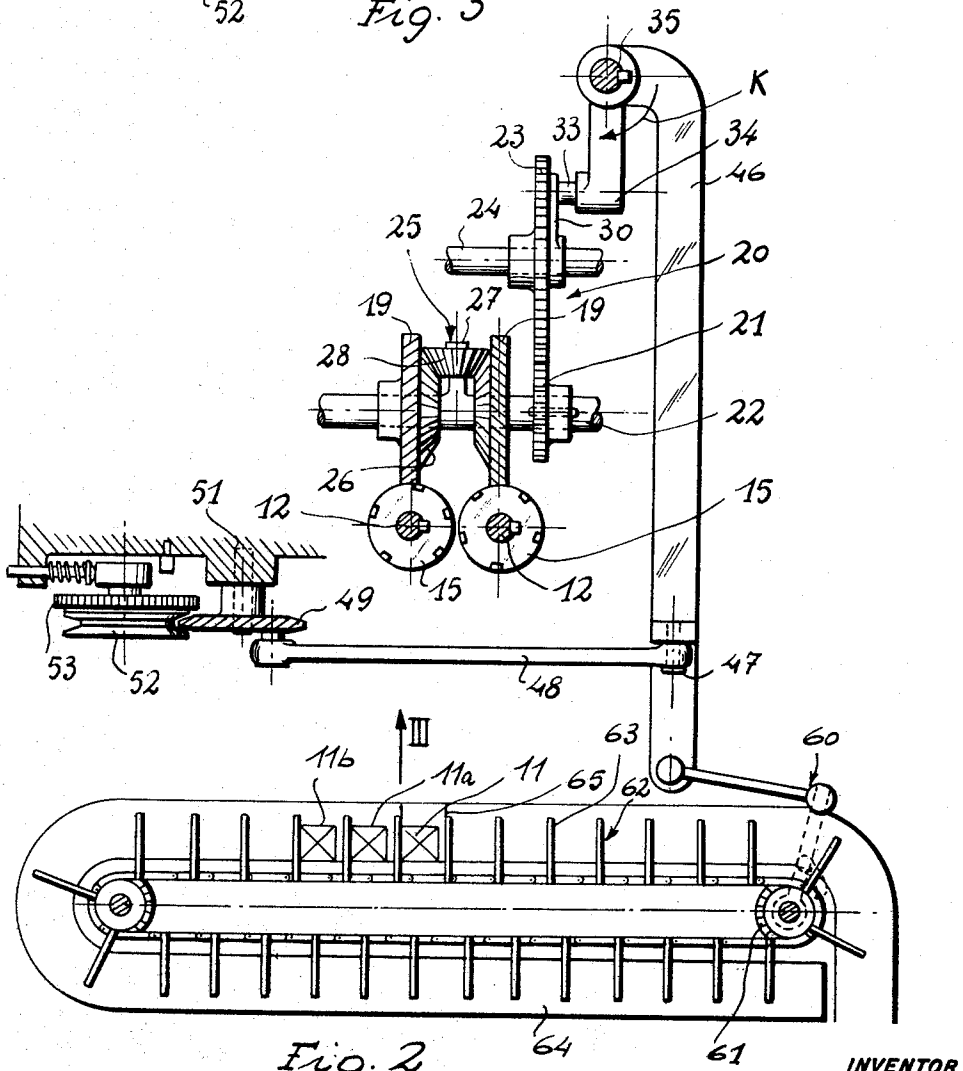

Fig. 2

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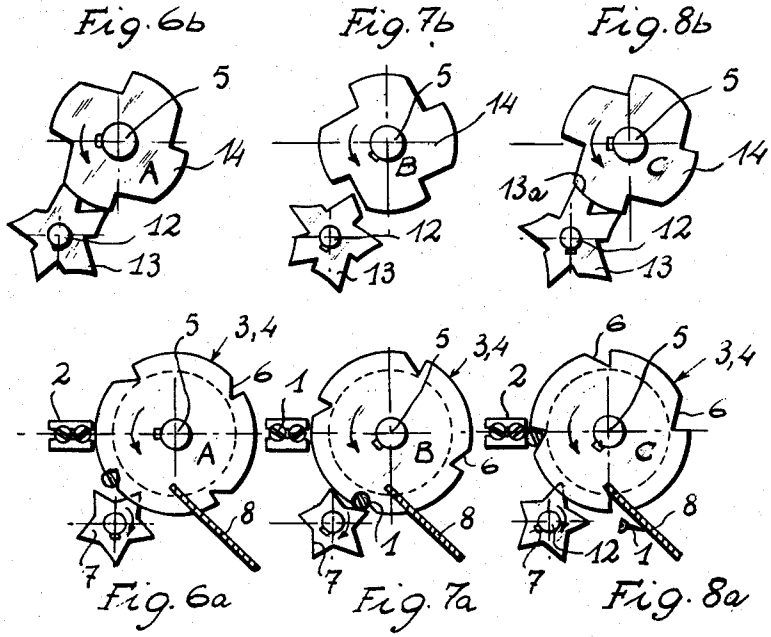
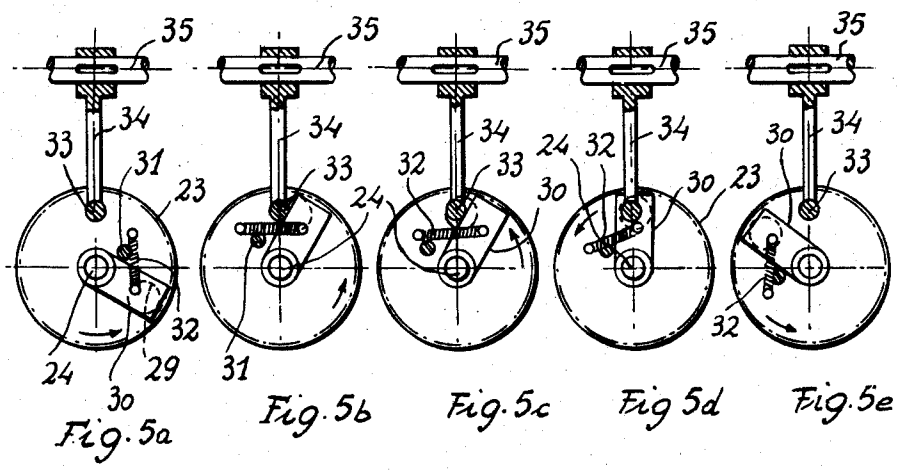
AUTOMATIC COUNTING MACHINE FOR SCREWS, NAILS AND SIMILAR ARTICLES

Filed April 25, 1960 3 Sheets-Sheet 3





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Paolo Chiaia

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3,096,603

AUTOMATIC COUNTING MACHINE FOR SCREWS, NAILS AND SIMILAR ARTICLES

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9 Claims. (Cl. 53—78)

This invention has reference to an automatic machine for counting and boxing screws or similar articles, the sale of which is regulated by number rather than by weight. It is well-known that screws and similar articles are offered for sale in packets containing a predetermined number, for instance one gross, thereof. However, for economical reasons, the articles are not counted separately, but are merely weighed, proceeding on the assumption that the number of articles charged into any one box is of a predetermined value whenever the weight of the charged box is equal to that of a box containing the same number of articles which have been counted. In other words, the arithmetical process is substituted by the comparatively simpler process of weighing. When this procedure is adopted, it may not infrequently occur that the number of articles actually charged into a box falls below the predetermined number, and as a result people prefer (in order expressly to avoid complaints), subsequent to charging the boxes to the desired weight, to add a few extra articles to each box. So far as the producer is concerned, this procedure is somewhat uneconomical, since each box sold contains a larger number of articles than the stated figure.

The principal object of the present invention is the removal of this objection by providing and using a machine which precludes the possibility of miscalculations; that is to say, a machine which will prevent the boxing of a number of articles in excess of or less than a predetermined number.

A further object of the invention is the provision of a machine designed primarily and expressly for mechanised industry and which is operated by purely mechanical means in that electrical apparatus, for instance electromagnets, photo-electric cells, and such-like are excluded.

In accordance with the said invention, an automatic boxing machine equipped with a counting device is characterised in that each individual screw or similar article to be boxed is so impelled by at least one transporter, preferably a peripherally indented drum, that, during the course of its transportation, the screw establishes a connection between a driving element and the counting-device, and that such connection, which is established by each of the several articles, results in the articles being counted, the transporter being immobilized whenever a predetermined number of articles has been counted and discharged to a box.

Preferably the transporter drum receives one article at a time in each of its peripheral indents which are spaced apart around the drum circumference; as each article is being transported it comes into contact with and actuates an intermediate drive-transmitting unit which is coupled to and is adapted to operate the counting device; the connection between the driving element and the counting device is instigated and established by each article in succession, until the requisite number of articles has been counted, after which the counting device puts the transporter drum out of commission until such time as a box into which the counted articles have been discharged, has been replaced by an empty box.

In order to forestall and prevent a breakdown of the transporter drum or drums and/or the operation of the said drum or drums as a result of any incomplete introduction of an article into a peripheral indent, the drum or drums may be driven through a shifting-jaw clutch

having mainly trapezodial surfaces, which clutch disengages automatically when rotation of the or either transmitter drum is prevented or resisted.

Further, in order to prevent any of the articles being damaged while establishing the connection between the driving element and the counting device, the said article may be impinged upon one of the points of a primary star wheel included in the drive transmitting unit, which point projects into the path of travel of the article but is removable from the said path by a small angular movement of the star wheel; during this angular movement one of the points of a secondary star wheel included in the drive transmitting unit may be inserted into the path of, and be actuated by, the driving element to operate the counting device.

In order that the invention may be more fully understood and carried into practice, reference will now be made to the accompanying drawings wherein:

FIGURE 1 is a perspective view of the operative parts of an automatic machine for boxing screws.

FIGURE 2 is a diagrammatic elevation of the counting device and of mechanism for intermittently feeding forwards both full and empty boxes.

FIGURE 3 is a view looking in the direction of the arrow III, FIGURE 2.

FIGURE 4 is a diagrammatic plan of the transporter drums of the machine, looking in the direction of the arrow IV, FIGURE 1.

FIGURES 5*a*–5*e* are, respectively, diagrammatic elevations showing the sequence of operation of the means which instigate the temporary immobilization of the transporter drums and the intermittant forward feed of the boxes.

FIGURES 6*a* and 6*b* are, respectively, diagrammatic plans of a transporter drum and its associated driving element immediately after a screw has engaged a drum indent, and

FIGURES 7*a* and 7*b* and 8*a* and 8*b* are plans similar to those of FIGURES 6*a* and 6*b* respectively, but showing the drum and driving element in two successively later stages in an operational cycle of the machine.

With the assistance of any suitable known feeding means, (not shown) the screws **1** and/or other articles which it is intended to box, are delivered in a well-ordered arrangement, into two parallel and inclined runways **2**, in which the screws are held vertically by their heads and down which the said screws slide consecutively towards a twin transporter comprising two drums **3** and **4**. Each drum is fast upon a corresponding one of two shafts **5** which are rotated about their axes by a motor (not shown). At equi-distant intervals around its circumference, each drum is formed with four indents **6** each of which is adapted to receive one of the screws from the corresponding runway. The two drums are so staggered relatively to one another that the axes of their shafts **5** are located in a plane which is inclined at 45° to the runways **2**. The screws, dropping into the drum indents, are transported in the directions of the arrows (FIGURE 1) towards a correspondingly primary star-shaped wheel **7**, which is level with and of which one of its points penetrates into, a circumferential groove **9** surrounding the corresponding drum. As each screw is being transported in one of the indents, its shank comes into contact with the groove-penetrating point of the corresponding primary star wheel, whereupon the wheel is rotated to cause the next adjacent point to enter the groove, after traveling beyond the wheel, the screw reaches a V-shaped extractor **8** and its head abuts and rides along one arm of the said extractor thereby effecting the unloading of the screw from the drum into a chute **10** down which it falls into a box **11** that is waiting to be filled. The gentle rotation imparted to the star wheel **7** by the screw, effects the en-

suing rotation of a shaft **12** and simultaneously the rotation of a secondary star wheel **13** which, like the wheel **7**, is fast upon the shaft **12**. The said secondary star wheel is shaped and arranged in such a manner that, as each screw enters an indent in the corresponding transporter drum, the extremities of two of its points (see FIGURE 6*b*) contact the periphery of one of four lobes of a cam-shaped driving element **14** which is rotated continuously and serves the purpose of assuring a further angular forward step of all elements mounted on the shaft **12**, and amongst these there is included a drum **15** having a system of four identical cam slots (described in more detail hereinafter) in its periphery in order to impart a given angular movement to a cog-wheel **19**.

The relative positions of the transporter drums, of the star wheels **7**, **13** and of the driving cam **14** are shown in FIGURES 6, 7 and 8. FIGURES 6*a* and 6*b* indicate a screw **1** introduced into an indent **6** and preparatory to coming into contact with the corresponding primary star wheel **7**, so that the secondary star wheel **13** is stationary in its initial position although the cam-shaped driving element **14** continues its rotation. Immediately the screw **1** comes into contact with the point of the primary star wheel (see FIGURES 7*a* and 7*b*) which is penetrating into the groove **9**, the screw effects the displacement of the wheel in the arrowed direction, so that the shaft **12** and the secondary star wheel are turned and one of the two points which, previously were in contact with a lobe of the driving element, is moved into the path of travel of and is impinged by the next adjacent lobe; hence, the driving element continues the rotation of the star wheels and shaft by transplanting them into the positions illustrated in FIGURES 8*a* and 8*b*, in which the surface **13***a* of the adjacent point of the secondary star wheel comes into contact with the outer surface of the said next adjacent lobe of the driving element, whereby the latter acts as a stop and prevents the shaft **12** moving on through inertia. In this position (see FIGURE 8*a*) a further point of the primary star wheel penetrates into the circumferential groove of the transporter drum ready to be displaced by the following screw **1**, preparatory to a repetition of the modus operandi just described. Expressed in few words, the impingement of the screws successively with the primary star wheel merely serves the purpose of initiating the movement of the shaft, which movement is thereupon continued by the driving element **14**. Thus the screws encounter no resistance that could conceivably damage them.

The rotary movement transmitted to the secondary star wheel **13** by the driving element **14** is transmitted to the drum **15** which is also fast on the shaft **12**. The drum **15** has four cam grooves in its periphery and each groove has a central part **16** which is located in a plane at right angles to the axis of the said shaft and is flanked by two helically shaped parts **17** and **18** opening respectively to the top and bottom of the drum (see FIGURE 1): the grooves **16**, **17**, **18** are adapted to engage in succession a tooth of the cog wheel **19** so that the wheel is rotated through an angle corresponding to the pitch of its teeth each time one tooth is engaged and traversed by one of the grooves. The said drum **15** has as many grooves as the secondary star wheel has points, and it effects the rotation of the cog-wheel **19** each time the secondary star wheel is turned first by a drum-supported screw and then by the driving element. The arrangement and shape of each cam groove **16**, **17**, **18** is such that the first phase of each rotary movement of the shaft **12**, that is to say the movement effected by impact of a screw **1** with a point of the primary star wheel **7**, occurs when the central part **16** of the groove is engaging a tooth of the cog-wheel; that is to say, when there is no appreciable resistance to the rotation of the shaft. The second phase of each rotary movement of the shaft which is instigated by the subsequent engagement of a lobe of the driving element **14** with a point of the secondary star wheel, occurs when the trailing downwardly inclined part **18** of the groove is engaging a tooth of the cog-wheel. In this way, the screw-initiated rotary movement of the shaft is not transferred to the cog-wheel **19** or to the counting mechanism, so that the screw is not subjected to any injurious stresses. Moreover, the cog-wheel is stationary each time one of its teeth is engaged by a groove part **16** and whilst the said part is traveling over the tooth so that the wheel is stationary during the first phase of each intermittent rotary movement of the shaft. It is to be noted that the two transporter drums **2** and **4** are arranged in such a manner that their primary star wheels **7** cannot be actuated simultaneously.

In case the machine comprises only one transporter drum, then the cog-wheel could transmit drive direct to the counting device, but for that purpose it would require to be provided with a number of teeth equal to the predetermined number of screws to be charged into each box. In such cases the cog-wheel could be constructed like the toothed counting wheel **23** referred to below. But since, and this for very glaring construction reasons, provision must be made for two transporter drums, it has been seen fit to arrange for a mechanism which gives due consideration to the transportations effected by both drums, and which transmits the drum movements to the wheel **23**, which latter transmits drive direct to the counting device (not shown). The aforementioned mechanism comprises a differential **25** (see FIGURE 2) including the cog-wheels **19** which respectively co-operate with, and are driven by, the cam drums **15** on the shafts **12**. Each cog-wheel **19** is connected with, and is concentric to, a corresponding crown wheel **26**, and both are mounted on and are rotatable relatively to a shaft **22**, on a radial projection **27** of which a conical sun wheel **28**, meshing with the crown wheels, is journalled. By this arrangement the sun wheel **28**, and with it the shaft **22**, is caused to rotate by every rotary movement imparted to one of the cog-wheels: a pinion **21** fast on the shaft **22**, transfers each rotary movement of the said shaft to the counting wheel **23**. In the main the differential has the effect of totalizing the intermittant rotary movements imparted to the two cog-wheels **19** by the respective drums **15**, and of transmitting such movements to the counting-wheel **23**. At the end of every complete revolution of the counting wheel, corresponding to the boxing of the predetermined number of screws, it is desirable that the machine should come to a stop so as to permit replacement of the box **11** into which the screws have been charged and which is located below the discharge end of the chute **10**, by a fresh and empty box. For this purpose an eccentric aperture **29** is formed in the counting wheel **23**; this aperture is covered up by a slide **30** mounted on and rotatable about the shaft **24** of the counting wheel; a tension spring **32** connected between the slide and the counting wheel **23**, urges the slide into contact with a peg **31** on the said wheel to locate the slide in its aperture-covering position. A feeler stud **33** provided on an arm **34** projecting radially from and fast upon a shaft **35**, operates in conjunction with the aperture **29** in the manner illustrated in FIGURES 5*a*–5*e*. In FIGURE 5*a*, the counting wheel **23** is shown in a position wherein the slide **30** is covering the aperture and is displaced from the feeler stud whereas the stud is urged into contact with the lateral surface of the counting wheel by a tension spring **36** (see FIGURE 1) acting on the stud through a locking arm **37**, a shaft **36** and an arm **33** on which the said stud is provided.

As the counting wheel is rotated in the direction of the arrow shown in FIGURES 5*a*–5*e*, the spring **32** holds the slide **30** in contact with the peg **31** so that the slide rotates with the wheel. Eventually, and as the counting wheel is about to reach the end of one complete revolution, the slide contacts (see FIGURE 5*b*) the feeler stud so that the slide ceases to rotate with the wheel; consequently, the aperture **29** moves beyond the slide and into register with the feeler stud (see FIGURE 5*c*)

whereupon the stud enters the aperture under the action of the spring **36** permitting a rotary movement of the shaft **35** in the direction of arrow K, FIGURE 2, which causes the feeler stud to enter the aperture.

The entry of the stud **33** into the aperture **29** results in an angular movement of the stud carrying arm **34** and a corresponding rotary movement of the shaft **35** and angular movement of the locking arm **37**. The said locking arm has a nose **38** projecting laterally of its free end and the said angular movement enables the nose to engage between two adjacent teeth **40** on the periphery of a toothed locking wheel **39** fast upon the motor driven shaft **5**, thereby terminating the rotation of the shaft. Meshing pinions **41** which are respectively fast upon the two shafts **5**, ensure that both shafts are rotated in unison and their rotation is terminated simultaneously.

Drive to the motor driven shaft **5** from the motor shaft **42**, is transmitted from a shifting-jaw clutch **43**; the clutch comprises a driving disc which is fast upon the motor shaft **42** and is provided with an annular system of trapezoidal projections each of which engages in a complementary pocket or recess in the adjacent face of the driven disc of the clutch. The driven disc is held against rotation relatively to the motor driven shaft **5**, but mounted to slide lengthwise of the shaft **42** away from the driving disc, against the action of a compression spring **45**. Hence, when the rotation of the motor driven shaft **5** is terminated by the engagement of the nose **38** between two adjacent teeth **40**, the projections of the driving clutch plate ride out of the respective depressions in the driven clutch plate while the latter is displaced along the driven shaft against the action of the spring **45** thereby permitting relative rotation between the motor and the motor driven shafts **42** and **45**.

An arm **46**, which is also fast upon the shaft **35**, projects radially from the said shaft and one end of the rod **48** is articulated, by a coupling **47**, to the vicinity of its free end; the rod (see FIGURE 3) projects laterally of the arm **46** and its opposite end is journalled upon an eccentric pin provided on and projecting laterally from a friction disc **49** (composed of fibrous or other friction material) journalled upon a stub axle **50** provided on the frame of the machine. The friction disc **49** is co-planar with the circumferential groove of a drive disc **52** and is of such a radius that it is adapted to enter the said circumferential groove and be driven by the drive disc **52**. However, an arcuate recess **51** is formed in the periphery of the friction disc **49** and, before the feeler stud **33** enters the aperture in the counting wheel, this recess is (as shown in FIGURE 3) located adjacent the periphery of the drive disc **52** so that the rotation of the latter does not rotate the disc **49**.

Upon entry of the feeler stud into the counting wheel aperture, the consequent rotary movement of the shaft **35** swings the arm **46** to displace the rod **48** in the direction of the arrow Z shown in FIGURE 3; consequently the rod turns the friction disc **49** a sufficient distance to enable the periphery of the disc **49** at one end of the arcuate recess **51**, to enter and be gripped within the groove of the rotating drive disc **52** so that the disc **49** is turned through a complete revolution and the recess **51** is returned to the position shown in FIGURE 3. The rotation of the friction disc **49** first continues the displacement of the rod **48** in the direction of the arrow Z and then displaces it in the reverse direction through a sufficient distance to turn the shaft **35** (in the opposite direction to the arrow K) through a sufficient distance to remove the feeler stud from the counting wheel aperture and to disengage the nose **38** from the wheel **39**; hence the rotation of the shaft **24** and of the counting wheel **23** is recommenced. Further, as the feeler stud is withdrawn from the counting wheel aperture, the tension spring **32** turns

the slide **30** about the shaft **24** into re-abutment with the peg **31**, thereby reclosing the aperture (see FIGURE 5*d*).

The entrance of the feeler stud into the counting wheel aperture, takes place at the end of a complete revolution of the wheel when the predetermined number of screws has been charged into the box **11** and the cycle of operations of the machine is recommenced as the stud is withdrawn from the aperture.

The drive disc **52** is fixed to and concentrically of a pinion **53** which is fast upon a shaft **54** (see FIGURE 1) rotated continuously by meshing worm wheels **55** of which one is fast upon the said shaft **54** and the other is fast upon the motor shaft **42** so that the drive disc **52** is rotated continuously.

The angular movement imparted to the arm **46** by the entrance of the feeler stud into the counting wheel aperture, also actuates a jack mechanism **60**, so as to displace a conveyor belt **62** provided with a system of spaced arms **63**; the conveyor arms extend above a track **64** and the box **11** which has been charged with the predetermined number of screws, and empty boxes **11***a* are supported on the track, each between two adjacent arms. Hence, the operation of the jack mechanism by the angular movement of the arm **46** moves the boxes along the track through a distance sufficient to remove the charged box from below the discharge end of the chute **10** and to bring an empty box into position for receiving the predetermined number of screws during the next cycle of operations of the machine.

The track **64** has an opening formed therein immediately below the discharge end of the chute and a box-supporting plate **65** is located in and fills the said opening. The plate is carried by and fixed upon a rod **67** which is connected to the chute and is adapted to be vibrated longitudinally by any suitable vibrator (for example a rotating turntable contacting and adapted to vibrate an arm fixed to the rod **67**) so as to shake the plate and chute thereby ensuring that, as each screw is extracted from an indent in either of the transporter drums **3**, **4**, it travels down the chute and into the box **11** and the screws in the box are caused to occupy a minimum volume.

Since the modus operandi of the machine has, so far, been described in terms of the passage of the screws from the runways **2** to the box **11**, it would now appear to be appropriate to look rather closely at the behaviour of the machine in the event of a breakdown of the transporter drums **3** and **4** which would prevent them from being rotated, and/or in the event of the clogging of either runway, the screws are prevented from reaching the said drums which would then tend to rotate without screws in the indents **6** thereof. In both events, the consequence would be identical because the primary star wheels **7** would remain stationary and therefore the shaft **12**, the cammed driving element **13** and the drum **15** would not be rotated. The inevitable consequence would be that the counting mechanism **20** would not be operated. Therefore, any miscalculation in counting the number of screws charged into the box **11** is prevented.

What I claim is:

1. An automatic machine for counting screws and similar articles comprising a rotatable drum with a series of peripherally spaced indents, each receiving only one article, a drive for rotating said drum, stationary discharge means for removing each article from the respective indent after said drum has rotated through an angle and for discharging the removed article towards an outlet, coupling means interposed in the arcuate path of the article transported by said rotatable drum so that a temporary driving connection between said drum and said coupling means is established, a counting device to count the articles transported by said drum, and means connecting said counting device with said coupling means

so that said counting device is temporarily coupled with said drive through said coupling means as the article impinges said coupling means in such a manner that said counting device is actuated whenever a transported article engages one of said coupling means.

2. An automatic machine according to claim 1, wherein said rotatable drum is peripherally grooved and said coupling means includes a star wheel one point of which entering in said groove so to be impinged by the transported article thus establishing a temporary connection between the drive and the counting device.

3. An automatic machine for counting screws, nails and similar articles comprising a drive, a rotatable drum transporter rotated continuously by said drive and being peripherally recessed at spaced intervals, each of said recesses being adapted to receive only one article, inlet means to introduce an article in one of said recesses, outlet and discharge means to remove the articles transported by said drum in said recesses, said inlet means and said outlet means being peripherally spaced along said drum, the articles transported by said drum thus traveling along an arcuate path of movement, a geared wheel connected with said rotatable drum to rotate with the latter, star wheel means interfering in the arcuate path of movement of the transported articles so that a temporary driving connection between said drum and said star wheel is established, a geared wheel connected with said star wheel means, said latter geared wheel engaging the first geared wheel to be angularly displaced therewith through a limited angle of rotation as an article transported by said rotatable drum impinges the points of said star wheel means, motion transmitting means connected with said latter geared wheel and said star wheel to rotate therewith, and counting means driven by said motion transmitting means for counting each angular displacement of said star wheel and of said latter geared wheel caused by articles impinging upon said star wheel means in such a manner that said counting device is actuated whenever a transported article engages one of said coupling means.

4. An automatic machine for counting screws, nails and similar articles comprising two rotatable drums peripherally recessed at spaced intervals, each recess being adapted to receive and transport only one article, conveying means associated with each of said drums for conveying said articles in a lined up manner to said drums, outlet and discharge means for removing the articles transported by said drums in said recesses, motor means to rotate said drums, said drums being mutually dephased, coupling means for each drum interfering in the path of movement of the transported articles so that a temporary driving connection between said drum and said coupling means is established, a counting device, and means connecting said coupling means with said counting device, each of the said coupling means establishing a drive connection between the respective rotating drum and said counting device in such a manner that said counting device is actuated whenever a transported article engages one of said coupling means.

5. A machine for counting articles and comprising, in combination, a rotary first member having a set of circumferentially spaced holding means for receiving articles; drive means for rotating said first member with said articles; a turnable second member having a plurality of projections and being located in close proximity to said first member and to said holding means so as to be located in the path of movement of the articles in said holding means and to be successively engaged by the articles in such a manner that said second member is angularly displaced a selected angle when any one of said projections is engaged by an article; a first coupling wheel driven by said drive means, and a second coupling wheel connected to said second member for turning movement, said first and second coupling wheels having a plurality of relative positions in which they are disconnected from each other, and a plurality of coupling positions in which they are coupled to each other, said second member turning said second coupling wheel from any of said disconnected positions to a coupling position when being angularly displaced said selected angle, and said first coupling wheel turning said second coupling wheel in said coupling position through an additional selected angle so that said second coupling wheel is turned to the next following disconnected position; and counter means operatively connected to said second coupling wheel and actuated under the control of said second member to count the displacements of said second member and thereby said articles in such a manner that said counter means is driven by said drive means through said first and second coupling wheels while said second member only initiates the actuation of said counter means.

6. A machine as set forth in claim 5 including means for locking said first member against rotation when said second coupling wheel and said first coupling wheel are in said disconnected position; and including a slip clutch means connecting said drive means with said first member.

7. A machine for counting articles and comprising, in combination, a rotary first member having a set of circumferentially spaced holding means for receiving articles; drive means for rotating said first member with said articles; a turnable second member having a plurality of projections and being located in close proximity to said first member and to said holding means so as to be located in the path of movement of the articles in said holding means and to be successively engaged by the articles in such a manner that said second member is angularly displaced a selected angle when any one of said projections is engaged by an article; a first coupling wheel driven by said drive means, and a second coupling wheel connected to said second member for turning movement, said first and second coupling wheels having a plurality of relative positions in which they are disconnected from each other, and a plurality of coupling positions in which they are coupled to each other, said second member turning said second coupling wheel from any of said disconnected positions to a coupling position when being angularly displaced said selected angle, and said first coupling wheel turning said second coupling wheel in said coupling position through an additional selected angle so that said second coupling wheel is turned to the next following disconnected position; counter means; and transmission means connecting said second coupling wheel with said counter means and including a cam wheel having a plurality of circumferentially and axially extending cam tracks respectively correlated with said projections of said second member, and a cog wheel meshing with said cam tracks, said cam tracks having track portions extending in a plane perpendicular to the axis of rotation of said cam wheel, said cog wheel engaging said track portions when said projections are engaged by said articles so that no force is transmitted through the articles to said counter means and said counter means is actuated by said second counter wheel under the control of said second member to count the displacements of said second member and thereby said articles.

8. A machine for counting articles and comprising, in combination, a rotary first member having a set of circumferentially spaced holding means for receiving articles; drive means for rotating said first member with said articles; a turnable second member having a plurality of projections and being located in close proximity to said first member and to said holding means so as to be located in the path of movement of the articles in said holding means and to be successively engaged by the articles in such a manner that said second member is angularly displaced a selected angle when any one of said projections is engaged by an article; counter means actuated under the control of said second member to count the displacements of said second member and thereby said articles, said counter means including a counter wheel performing a single revolution for a selected number of articles trans-

ported by said first member, said counter wheel having an opening; sensing means sliding on said counter wheel for sensing said opening and thereby each revolution of said counter wheel; and locking means for locking said second member against rotation and being operated by said sensing means.

9. A machine for counting articles comprising two rotary drums, each drum having a set of circumferentially spaced holding means for receiving articles; feeding means for supplying articles to said holding means; discharging means for removing articles transported by said drum; drive means for rotating said drums so that said holding means of said two drums alternately arrive at said discharging means; rotary star wheel means for each of said drums located in the path of movement of the articles transported by the respective drum so that a temporary driving connection between said drum and said star wheel means is established; a counting device; and means connecting said star wheel means with said counting device

and including two planetary gears respectively connected to said star wheel means and driven by the same, a shaft for driving said counting device, and a sun gear mounted on said shaft and turning the same and said counting device under the control of said star wheel means in such a manner that said counting device is actuated whenever a transported article engages one of said star wheel means.

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