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(54) **Station for determining a preset number of articles, partially inserted in one another, forming a group of these articles**

Zählstation für eine vorbestimmte Anzahl von teilweise ineinandergestapelten Artikeln, eine Gruppe solcher Artikel bildend

Station de comptage d'un nombre donné d'articles partiellement insérés les uns dans les autres, de manière à grouper lesdits articles

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(56) References cited:
EP-A- 0 302 837 **EP-A- 0 654 408**
FR-E- 88 882

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Description

[0001] The present invention concerns packaging articles which can be partially inserted in one another, e. g. plastic beakers used for food.

[0002] These beakers are usually sold in series, each series containing a predetermined number thereof.

[0003] The beakers going out of the rim making machine are arranged in a series of stepwise spaced out horizontal rows.

[0004] The beakers in each row are partially inserted in one another.

[0005] Downstream of the rim making machine there is a packaging machine, that takes groups of beakers and wraps them into packages.

[0006] A device for dividing the rows of beakers into groups of predetermined number thereof, is disposed between the rim making machine and the packaging machine.

[0007] Known devices for forming the groups of beakers usually include a toothed wheel which meshes with a row of beakers, so as to count them.

[0008] The toothed wheel co-operates with separating means, of various shapes, which separate each group from the row of beakers.

[0009] The major disadvantage of these known devices is a low working speed which reduces the global production rate and does not guarantee an acceptable reliability.

[0010] It is possible that the beakers, due to their shape and the material from which they are made, are not spaced out regularly. Counting errors can occur quite often and/or the toothed wheel can damage the beakers increasing the number of rejected products.

[0011] EP 302 837 discloses a counting device usable in the present invention in a station corresponding to the preamble of appended claim 1.

[0012] More generally, it is important to avoid halting of the rim making machine because of jamming occurred downstream thereof up to the outlet of the packaging machine, where the number of rejected products would become very high.

[0013] EP 654 408 discloses a feeding device for feeding articles from a processing machine to two packaging machines, alternatively. In case of malfunction of one of the packaging machines, the articles can be all directed towards the other one.

[0014] The object of the present invention is to propose a station, situated between a rim making machine and a packaging machine, and equipped with suitable means and devices, that co-operate with one another and feature the following technical - functional characteristics:

- high working speed
- capability of forming article groups with high counting precision

- no damages to the articles

- easy size change over

5 - high working flexibility, with capability of storing the rim making machine production for a period of time sufficient to remove a possible jam in this station or in the packaging machine situated downstream thereof.

10 **[0015]** Another object of the present invention is to propose a station, whose requested performance is achieved by simple technical solutions, which guarantee a high general reliability.

15 **[0016]** The characteristics of the invention are defined by appended claim 1 and will be evident from the following description, in accordance with the contents of the claims and with reference to the enclosed drawings, in which:

20 - Figure 1 shows a lay-out of a processing line including the subject station, according to a possible embodiment;

25 - Figure 2 shows a section view taken along II-II of the Figure 1;

- Figure 3 shows a perspective view of a constructive detail of the station;

30 - Figure 4 shows an enlarged view of the part indicated in Figure 1;

35 - Figure 5 shows a lateral view of the means of Figure 4;

- Figure 6 shows a perspective view of the means for counting beakers and forming predetermined groups;

40 - Figures 7a, 7b, 7c show lateral views of the means of Figure 4, in different working steps.

45 **[0017]** With reference to the above mentioned figures, reference numeral 100 indicates the whole subject station for forming groups 10 containing a predetermined number of articles 1 partially inserted in one another.

[0018] In the example illustrated in the figures, these articles 1 are plastic beakers for food or beverages.

50 **[0019]** The group-forming station 100 is situated downstream of a rim making machine 2, which makes a rim around the upper edge 1a of each beaker 1, so as to allow its safe use, without the risk of injuring.

55 **[0020]** The groups of articles 10, leaving the station 100, are directed to a packaging station 3, situated downstream, where each group 10 is suitably packed by known, not shown, means.

[0021] The beakers 1 going out of the rim making ma-

chine 2, arranged in a series of horizontal rows 11 with the beakers of each row inserted in one another, are conveyed, by a conveying line 4, to a rotary displacement device 5 of the station 100.

[0022] In the illustrated example, the rotary displacement device 5 includes a shaft 50 equipped with a series of radial frames 51, angularly spaced apart.

[0023] The rotary displacement device 5 is supported, with possibility to turn, by a not shown structure, over the final part of the conveying line 4 and with the shaft 50 extending parallel to the line 4 (Figures 2 and 3).

[0024] Motor means, not shown, are joined to the rotary displacement device 5 and drive it into stepwise rotation, in one or the other direction. The width of each step corresponds to angular width between the two adjacent frames 51.

[0025] An inlet conveyor 61, joined to a first counting-separating device 60 of the station 100, is situated along the conveying line 4 near the rotary displacement device 5.

[0026] According to a preferred embodiment, a connection conveyor 7 extends on the other side of the line 4, between the rotary displacement device 5 and a second inlet conveyor 81 joined to a relative counting-separating device 80, identical with the first one.

[0027] The connection conveyor 7 has made therein a plurality of seats 70, each of which contains one row 11 of beakers 1; in this way the connection conveyor 7 acts as a storage unit, whose function will be better explained later on.

[0028] The first counting-separating device 60 is disposed upstream of a main packaging machine 30 of the packaging station 3, while the second counting-separating device 80 is disposed upstream of an additional packaging machine 31, also situated in the station 3.

[0029] The packaging machines 30, 31 are identical and have not been shown in detail, as they are of known type.

[0030] During normal operation, the rows 11 of beakers 1 conveyed by the conveying line 4 are gradually intercepted by the frames 51 of the rotary displacement device 5, which is operated in suitable time relation and according to a first direction R1 (Figure 2).

[0031] Thus the rows 11 are moved sidewise and put onto the inlet conveyor 61 of the first counting-separating device 60, which subsequently feeds the main packaging machine 30. These groups 10 comprise a predetermined number of beakers 1 and are obtained from these rows 11 as described in the following.

[0032] In case of failure of the main packaging machine 30 or the first counting-separating device 60, which is noticed by the operator or detected by suitable sensors, the rotary displacement device 5 is driven in the direction R2, opposite to the first one.

[0033] Operation of the rotary displacement device 5 displaces the rows 11 coming out from the rim making machine 2 to the connection conveyor 7, and subsequently to the second counting-separating device 80

and to the additional packaging machine 31 (Figure 2).

[0034] The storage unit, constituted by the connecting conveyor 7, is particularly advantageous

[0035] In fact, it allows activation of the second counting-separating device 80 and the additional packaging machine 31 without stopping the rim making machine 2.

[0036] During the shifting operation, an interval of time results which can be used for controlling the correct arrangement of the operating means.

[0037] Now, a preferred embodiment of devices 60, 80 will be described.

[0038] Besides the respective inlet conveyors 61, 81, each of the devices 60, 80 includes also centring means 9, made by e.g. a pair of longitudinal bars 9a opposite to each other.

[0039] The task of the longitudinal bars 9a is that of guiding the rows 11 of beakers 1 towards a disc 13, situated over the respective inlet conveyor, vertical and crosswise to the advancement direction of the beakers 1.

[0040] The disc 13 has an outer circular edge, that is divided in sectors 14, each of which is rotated by a predetermined angle about the respective radial symmetry line, like fan paddles.

[0041] The above mentioned rotation angle is sufficient for the distance between the adjacent edges of two successive sectors 14 to permit the rim 1a of a container 1 to be inserted therebetween in the region of the outer edge of the disc 13.

[0042] The disc 13 is driven by a motor 15, in a predetermined direction T.

[0043] The disc 13 is fitted with a plurality of holes 16 regularly spaced apart along a circumference, which is coaxial with the disc 13, each in correspondence to a relative sector 14 (Figure 6).

[0044] The disc 13 is provided also with suitable sensor means 17, which detect each hole 16 while passing thereby, and consequently, also a respective beaker 1 being moved downstream of the disc 13.

[0045] The row 11 of beakers 1, with their openings facing the disc 13, is pushed against the disc, being kept motionless, which halts the whole row (Figures 6, 7a).

[0046] Then, the disc 13 is made to rotate in direction T until the number of sectors 14 which pass the point of contact with the row 11 is the same as the number of beakers 1 required to form each group 10.

[0047] During rotation of the disc 13, the edge of every sector 14 is inserted between the rims of the first two beakers 1, thus separating them and pushing forward the first, while keeping the second one.

[0048] The separation of the so obtained group 10 from the row 11 is facilitated by two ducts 18, 19, fed with compressed air in suitable time relation with the disc 13 being stopped (Figures 7a, 7b, 7c).

[0049] An aspiration hood 20 is provided over the disc 13 for evacuating possible dust produced by the disc 13 rubbing against the beakers, by keeping the area under negative pressure.

[0050] Expeller means 40 and sensor means 39 are provided downstream of the disc 13.

[0051] The expeller means 40 include a stop pin 41 operated by a relative jack 42, and a pusher 43 operated by relative jacks 44.

[0052] The stop pin 41 is situated on the groups 10 outlet line and, when in its working position O (indicated with broken line in Figure 5), it stops the group 10 just formed by the disc 13.

[0053] The pusher 43 is situated beside the groups 10 outlet line and, when in its working position K (indicated with broken line in Figure 4), it displaces crosswise the group 10 blocked by the pin 41.

[0054] The sensor means 39, situated over the groups 10 outlet line, verify the regular flow of the groups toward the packaging machine, situated downstream.

[0055] If the packaging machine jams, the sensor means 39 detect the groups 10 accumulated at the machine inlet and issue a signal corresponding to the necessity to activate the expellers 40.

[0056] Then the group 10 just formed by the disc 13 is stopped by the pin 41 and transferred, by the pusher 43, toward a lateral discharge chute 45, so as to be subsequently collected.

[0057] When the main packaging machine 30 jams, the expeller means 40 of the first counting-separating device 60 allow to empty the line, while the rows 11 going out of the rim making machine 2 are sent, by the rotary displacement device 5, to the other counting-separating device 80 joined to the additional packaging machine 31.

[0058] If the additional packaging machine 31 jams before the main packaging machine resumes regular operation, it is not necessary to stop the rim making machine 2, because the expeller means 40 of the second counting-separating device 80 allow discharge of the groups 10 located beside the line, from where they will be collected later on.

[0059] It is clear that the station 100 as described, achieves all the objects specified in the introductory statement.

[0060] In fact, the additional line including also a storage unit allows to temporarily store the rim making machine production without stopping it, while the particular shape of the counting-separating devices 60, 80 allows to reach a high working speed together with the high precision of articles counting without risk of their damage.

[0061] It also appears that the operating means of the station 100 are very simple to adjust when the size of the articles 1 is changed, also because there are few standard sizes of beakers.

Claims

1. Station for grouping a predetermined number of articles partially inserted in one another, to form a

group of these articles, said groups being obtained by separating single articles from rows (11) of articles (1) coming from the outlet of an article processing machine (2) situated upstream of said forming station (100), and successively packed in a relative packaging station (3) located downstream of said forming station (100), said forming station including a first counting-separating device (60), connected to a main packaging machine (30) of said packaging station (3);

and being characterised in that it includes:

a second counting-separating device (80), connected to an additional packaging machine (31) of said packaging station (3);

a rotary displacement device (5), which displaces at least one of said rows (11) of articles (1), lying on a conveying line (4) situated at the outlet of said processing machine (2), towards said first counting-separating device (60) in case of regular operation, and towards said second counting-separating device (80), in case of jamming or non-regular operation.

2. Station according to claim 1, characterised in that it includes a connecting conveyor (7), situated between said rotary displacement device (5) and second counting-separating device (80) and acting as a storage unit of a predetermined number of said rows (11) of articles (1), released in sequence by said rotary displacement device (5) and transferred, by said connecting conveyor (7), to said second counting-separating device (80).

3. Station according to claim 1, characterised in that said rotary displacement device (5) includes a shaft (50) with a series of radial frames (51) angularly spaced apart, said rotary displacement device (5) being rotatably supported over the final part of said conveying line (4) and with said shaft (50) extending parallel to said conveying line (4), driving means being provided for driving said rotary displacement device (5) in stepwise rotation, the width of each step corresponding to angular width between two adjacent frames (51), respectively in a first direction (R1), if said groups forming station (100) works regularly, and a second direction (R2) opposite to the first one, in case of failure of the first counting-separating device (60) or said main packaging machine (30).

4. Station, according to claim 1, characterised in that each of said first and second counting-separating devices (60,80) includes:

an inlet conveyor (61,81), which conveys said rows (11) of articles (1) to a disc (13), arranged

vertical and

crosswise to the rows (11) advancement direction at a height that allows its outer edge to touch said rows (11), said disc (13) having said outer edge divided in sectors (14), each of which is rotated by a predetermined angle with respect to its radial axis, so that the distance between the edges of two adjacent sectors (14) allows insertion of the rim (1a) of an article (1) therebetween;

a motor (15) for driving said disc (13) into rotation in a predetermined direction (T) until the number of sectors (14) which pass the point of contact with the row (11) is the same as the number of articles (1) required to form one group (10).

5. Station, according to claim 4, characterised in that said disc (13) has a plurality of holes (16) regularly spaced apart along a circumference, which is coaxial with the disc (13), each hole being located in the region of a related sector (14), said disc (13) being also equipped with sensor means (17) for detecting and counting said holes (16) passing thereby due to the disc rotation.

6. Station, according to claim 4, characterised in that it includes also centring means (9), situated at the sides of the respective inlet conveyor (61,81) and aimed at guiding the rows (11) of articles (1) with respect to said disc (13).

7. Station, according to claim 4, characterised in that each of said counting-separating devices (60,80) has an aspiration hood (20), provided over the disc (13) for keeping the working area surrounding said disc (13) in depression.

8. Station, according to claim 1 or 4, characterised in that each of said counting-separating devices (60,80) has sensor means (39), connected to the expeller means (40), said expeller means (40) acting crosswise to said groups (10) formed downstream of said disc (13), so as to transfer these groups (10) from the relative outlet line to a lateral discharge chute (45) in case of a jam of a relative packaging machine (30,31) situated downstream of said counting-separating devices (60,80).

9. Station, according to claim 8, characterised in that said expeller means (40) include a stop pin (41), situated on the path run by the outlet line of each group (10) of articles, and a pusher (43) situated beside said groups (10) outlet line, said stop pin (41) and pusher (43) acting in time relation for stopping the group (10) formed downstream of said disc (13) and for transferring said group (10) toward said lateral discharge chute (45).

Patentansprüche

1. Station zum Gruppieren einer vorgegebenen Anzahl von teilweise ineinander gestapelten Gegenständen, um eine Gruppe dieser Gegenstände zu bilden, wobei die Gruppen durch Trennen einzelner Gegenstände aus Reihen (11) von Gegenständen (1) erhalten werden, die aus dem Auslaß einer stromauf der Formstation (100) angeordneten Gegenstandsverarbeitungsmaschine (2) kommen und nacheinander in einer stromab der Formstation (100) angeordneten relativen Verpackungsstation (3) verpackt werden, wobei die Formstation eine erste Zähl-Trenn-Vorrichtung (60) aufweist, die mit einer Hauptverpackungsmaschine (30) der Verpackungsstation (3) verbunden ist, dadurch gekennzeichnet, dass sie aufweist:

eine zweite Zähl-Trenn-Vorrichtung (80), die mit einer zusätzlichen Verpackungsmaschine (31) der Verpackungsstation (3) verbunden ist, und

eine Drehbewegungsvorrichtung (5), die zumindest eine der Reihen (11) der Gegenstände (1), die auf einer Förderbahn (4) am Auslaß der Verarbeitungsmaschine (2) liegen, bei normalem Betrieb zu der ersten Zähl-Trenn-Vorrichtung (60) und im Fall eines Staus oder irregulären Betriebs zu der zweiten Zähl-Trenn-Vorrichtung (80) bewegt.

2. Station nach Anspruch 1, dadurch gekennzeichnet, dass sie aufweist:

einen Verbindungsförderer (7), der zwischen der Drehbewegungsvorrichtung (5) und der zweiten Zähl-Trenn-Vorrichtung (80) angeordnet ist und als Speichereinheit für eine vorgegebene Anzahl der Reihen (11) von Gegenständen (1) wirkt, welche sequentiell von der Drehbewegungsvorrichtung (5) freigegeben und von dem Verbindungsförderer (7) an die zweite Zähl-Trenn-Vorrichtung (80) übertragen werden.

3. Station nach Anspruch 1, dadurch gekennzeichnet, dass die Drehbewegungsvorrichtung (5) eine Welle (50) mit einer Reihe winkelmäßig beabstandeter radialer Rahmen (51) aufweist, wobei die Drehbewegungsvorrichtung (5) über dem letzten Teil der Förderbahn (4) und mit parallel zur Förderbahn (4) verlaufender Welle (50) drehbar gelagert ist, Antriebsmittel zum Antreiben der Drehbewegungsvorrichtung (5) in schrittweiser Drehbewegung vorgesehen sind, die Breite jedes Schrittes dem Winkelabstand zwischen zwei benachbarten Rahmen (51) jeweils in einer ersten Richtung (R1) bei ordnungsgemäßem Betrieb der gruppenformenden Station (100), und in einer zweiten Richtung (R2) entgegengesetzt zu der ersten im Fall eines Versagens der

ersten Zähl-Trenn-Vorrichtung (80) oder der Hauptverpackungsmaschine (30) entspricht.

4. Station nach Anspruch 1, dadurch gekennzeichnet, dass jede der ersten und zweiten Zähl-Trenn-Vorrichtungen (60, 80) aufweist:

einen Einlassförderer (61, 81), der die Reihen (11) von Gegenständen (1) zu einer Scheibe (13) fördert, welche vertikal und quer zu der Förderrichtung der Reihen (11) auf einer Höhe angeordnet ist, auf der ihr Außenrand die Reihen (11) berühren kann, wobei die Scheibe (13) an ihrem Außenrand in Sektoren (14) unterteilt ist, die jeweils um einen vorgegebenen Winkel bezüglich ihrer radialen Achse gedreht werden, so dass der Abstand zwischen den Rändern zweier benachbarter Sektoren (14) das Eintreten des Randes (1a) eines Gegenstandes (1) dazwischen zulässt, und
einen Motor (15) zum Drehen der Scheibe (13) in einer vorgegebenen Richtung (T), bis die Anzahl der Sektoren (14), die die Kontaktstelle mit der Reihe (11) passieren, gleich der Anzahl der Gegenstände (1) ist, die zum Formen einer Gruppe (10) erforderlich ist.

5. Station nach Anspruch 4, dadurch gekennzeichnet, dass die Scheibe (13) mehrere Löcher (16) hat, die längs eines zu der Scheibe (13) koaxialen Umfangs gleichmäßig beabstandet sind, wobei jedes Loch im Bereich eines zugehörigen Sektors (4) angeordnet ist und die Scheibe (13) außerdem mit Sensormitteln (17) ausgerüstet ist, um die aufgrund der Scheibendrehung vorbeilaufenden Löcher (16) zu detektieren und zu zählen.

6. Station nach Anspruch 4, dadurch gekennzeichnet, dass sie ferner Zentriermittel (9) aufweist, die an den Seiten des entsprechenden Einlassförderers (61, 81) angeordnet sind und zum Führen der Reihen (11) von Gegenständen (1) bezüglich der Scheibe (13) dienen.

7. Station nach Anspruch 4, dadurch gekennzeichnet, dass jede der Zähl-Trenn-Vorrichtungen (60, 80) eine Absaughaube (20) hat, die über der Scheibe (13) angeordnet ist, um den die Scheibe umgebenden Arbeitsbereich unter Unterdruck zu halten.

8. Station nach Anspruch 1 oder 4, dadurch gekennzeichnet, dass jede der Zähl-Trenn-Vorrichtungen (60, 80) Sensormittel (39) hat, die mit den Auswurfmitteln (40) verbunden sind, wobei die Auswurfmittel (40) quer zu den stromab der Scheibe (13) geformten Gruppen (10) wirken, um diese Gruppen (10) von der relativen Auslassbahn im Fall eines Staus der stromab der Zähl-Trenn-Vorrichtungen

(60, 80) angeordneten relativen Verpackungsmaschine (30, 31) an eine seitliche Ausgaberutsche (45) zu übertragen.

9. Station nach Anspruch 8, dadurch gekennzeichnet, dass die Auswurfmittel (40) aufweisen:

einen Anschlagstift (41), der auf der Auslassbahn jeder Gruppe (10) von Gegenständen angeordnet ist, und einen Stößel (43), der neben der Auslassbahn der Gruppen (10) angeordnet ist, wobei der Anschlagstift (41) und der Stößel (43) in zeitlicher Beziehung so wirken, dass sie die stromab der Scheibe (13) geformte Gruppe (10) anhalten und diese Gruppe (10) an die seitliche Ausgaberutsche (45) übertragen.

Revendications

1. Poste de groupage d'un nombre prédéterminé d'articles insérés partiellement l'un dans l'autre, de façon à former un groupe de ces articles, lesdits groupes étant obtenus en séparant les articles unitaires à partir de rangées (11) d'articles (1) issus de la sortie d'une machine de traitement d'articles (2) située en amont dudit poste (100) de mise en forme, et successivement emballés dans un poste d'emballage (3) correspondant situé en aval dudit poste de mise en forme (100), ledit poste de mise en forme comprenant un premier dispositif de comptage et de séparation (60), relié à une machine principale d'emballage (30) dudit poste d'emballage (3);
et étant caractérisé en ce qu'il comporte :

- un deuxième dispositif de comptage et de séparation (80), relié à une machine additionnelle d'emballage (31) dudit poste d'emballage (3);
- un dispositif de déplacement rotatif (5), qui déplace au moins l'une desdites rangées (11) d'articles (1), s'étendant sur une ligne de convoyage (4) située à la sortie de ladite machine de traitement (2), en direction dudit premier dispositif de comptage et de séparation (60) dans le cas d'une opération normale, et en direction dudit deuxième dispositif de comptage et de séparation (80), en cas d'enrayage ou d'une opération anormale.

2. Poste suivant la revendication 1, caractérisé en ce qu'il comprend un convoyeur de liaison (7), situé entre lesdits dispositif de déplacement rotatif (5) et deuxième dispositif de comptage et de séparation (80), et agissant comme une unité de stockage d'un nombre prédéterminé de dites rangées (11) d'articles (1), libérées les unes après les autres par ledit dispositif de déplacement rotatif (5) et transférées, au moyen dudit convoyeur de liaison (7), vers ledit deuxième dispositif de comptage et de séparation

- (80).
3. Poste suivant la revendication 1, caractérisé en ce que ledit dispositif de déplacement rotatif (5) comporte un arbre (50) présentant une série de cadres radiaux (51) espacés angulairement, ledit dispositif de déplacement rotatif (5) étant supporté à rotation sur la partie finale de ladite ligne de convoyage (4), ledit arbre (50) s'étendant parallèlement à ladite ligne de convoyage (4), des moyens d'actionnement étant prévus pour actionner ledit dispositif de déplacement rotatif (5) suivant une rotation pas-à-pas, l'amplitude de chaque pas correspondant à l'amplitude angulaire entre deux cadres adjacents (51), respectivement dans une première direction (R1), si ledit poste de mise en forme par groupes (100) fonctionne normalement, et dans une deuxième direction (R2) opposée à la première, dans le cas d'une défaillance du premier dispositif de comptage et de séparation (60) ou de ladite machine principale d'emballage (30).
 - 5 7. Poste suivant la revendication 4, caractérisé en ce que chacun desdits dispositifs de comptage et de séparation (60, 80) comporte une hotte aspirante (20), disposée au-dessus du disque (13) de façon à maintenir en dépression la zone d'opération entourant ledit disque (13).
 - 10 8. Poste suivant la revendication 1 ou 4, caractérisé en ce que chacun desdits dispositifs de comptage et de séparation (60, 80) présentent des moyens de détection (39), reliés aux moyens d'expulsion (40), lesdits moyens d'expulsion (40) agissant transversalement par rapport audit groupe (10) formé en aval dudit disque (13), de façon à transférer ces groupes (10) de la ligne de sortie correspondante vers un canal d'évacuation latéral (45) en cas d'enrayage d'une machine d'emballage correspondante (30, 31) située en aval desdits dispositifs de comptage et de séparation (60, 80).
 - 15 9. Poste suivant la revendication 8, caractérisé en ce que lesdits moyens d'expulsion (40) comportent une broche d'arrêt (41), située sur le trajet au voisinage de la ligne de sortie de chaque groupe (10) d'articles, et un organe de poussée (43) situé sur le côté de la ligne de sortie desdits groupes (10), ladite broche d'arrêt (41) et ledit organe de poussée (43) agissant de façon synchronisée pour arrêter le groupe (10) formé en aval dudit disque (13), et pour transférer ledit groupe (10) en direction dudit canal d'évacuation latéral (45).
 - 20 25 30 35 40 45
 4. Poste suivant la revendication 1, caractérisé en ce que chacun des premier et deuxième dispositifs de comptage et de séparation (60, 80) comporte
 - un convoyeur d'entrée (61, 81), qui transporte lesdites rangées (11) d'articles (1) vers un disque (13) disposé verticalement et transversalement par rapport à la direction d'avancement des rangées (11) à une hauteur adaptée pour que son bord extérieur puisse venir en contact avec lesdites rangées (11), ledit bord extérieur dudit disque (13) étant divisé en secteurs (14), dont chacun est tourné d'un angle prédéterminé par rapport à son axe radial, de sorte que la distance entre les bords de deux secteurs adjacents (14) permet l'insertion du bord (1a) d'un article (1) entre eux ;
 - un moteur (15) pour entraîner ledit disque (13) en rotation dans une direction prédéterminée (T) jusqu'à ce que le nombre de secteurs (14) qui franchissent le point de contact avec la rangée (11) soit égal au nombre d'articles (1) requis pour constituer un groupe (10).
 5. Poste suivant la revendication 4, caractérisé en ce que ledit disque (13) présente une pluralité de trous (16) régulièrement espacés le long d'une circonférence, qui est coaxiale avec le disque (13), chaque trou étant situé dans la région d'un secteur correspondant (14), ledit disque (13) étant également pourvu de moyens de détection (17) pour détecter et compter lesdits trous (16) qui défilent sous l'effet de la rotation du disque.
 6. Poste suivant la revendication 4, caractérisé en ce qu'il comprend également des moyens de centrage

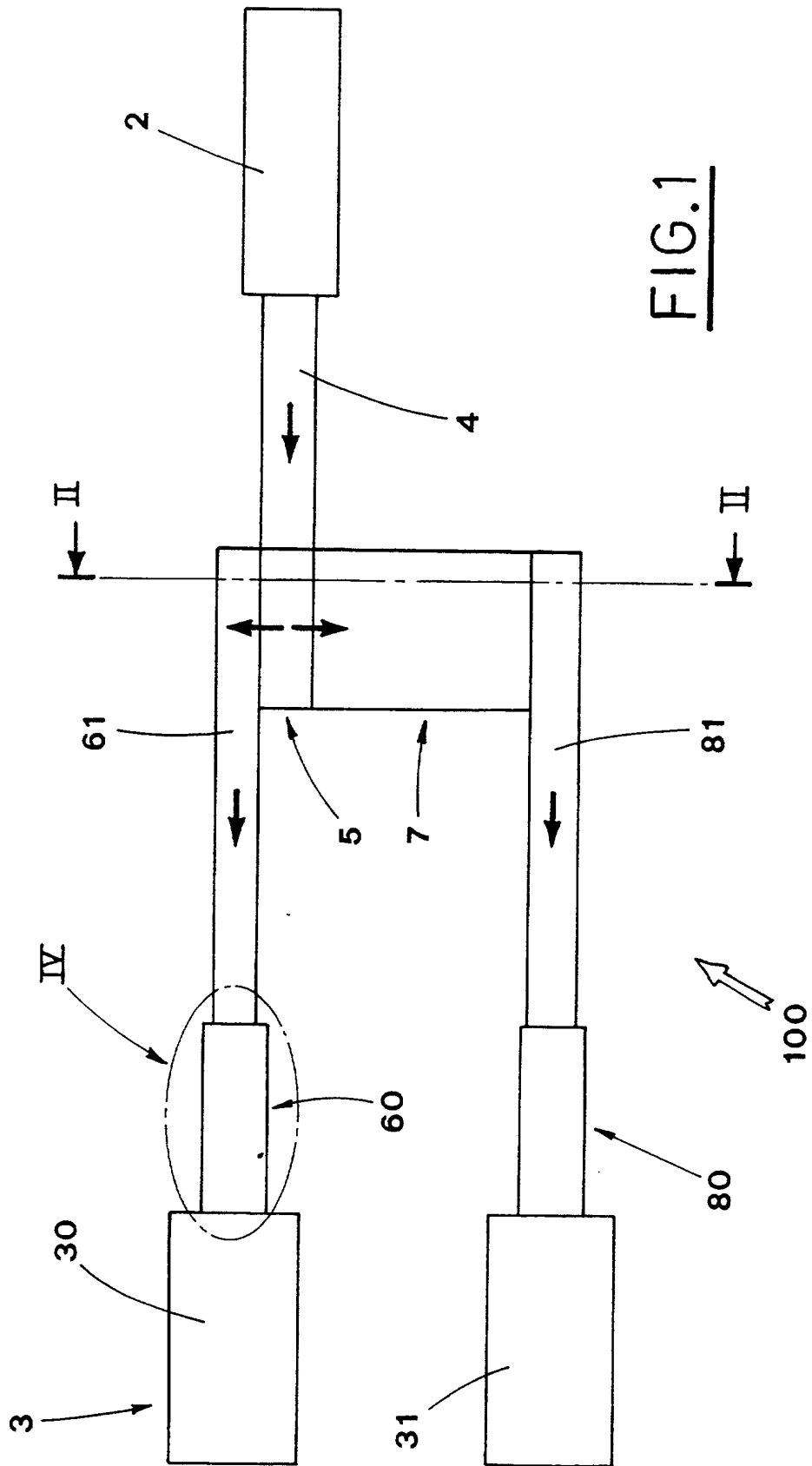


FIG.1

FIG. 2

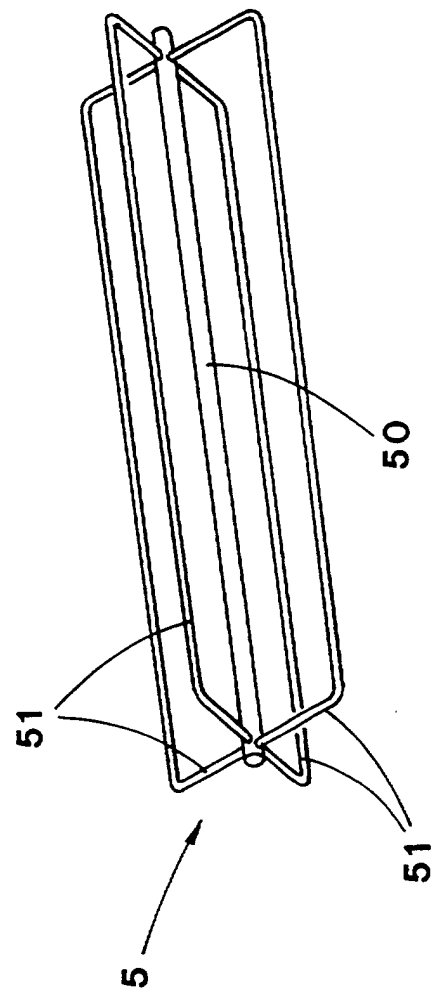
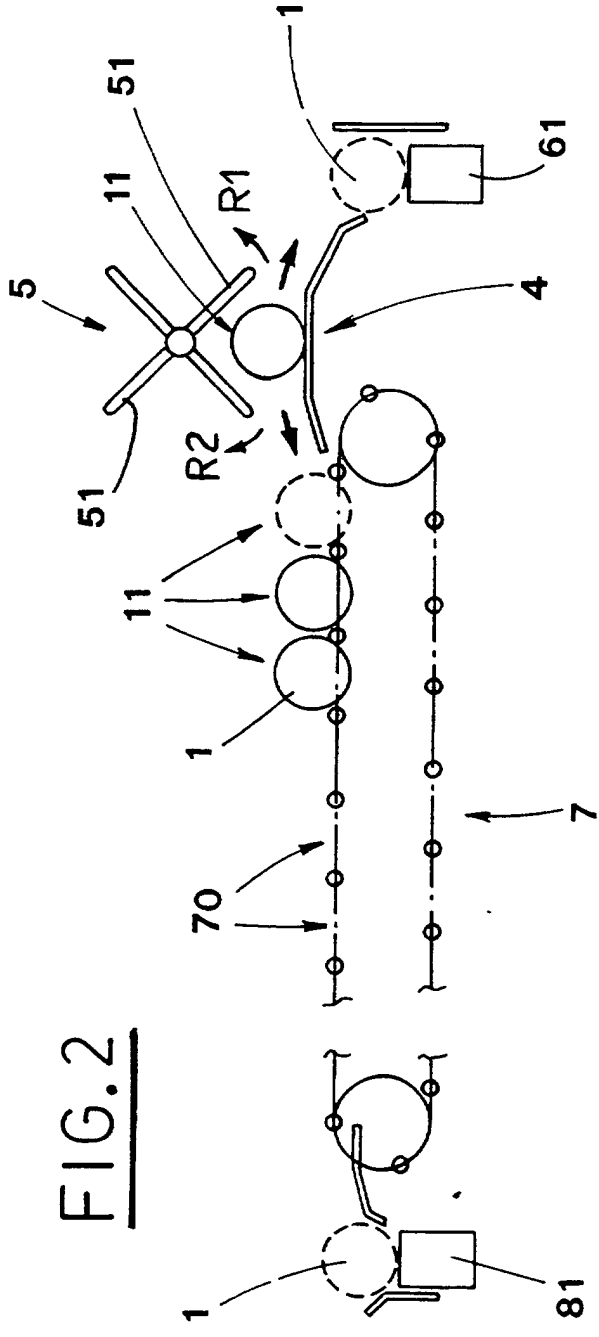


FIG. 3

FIG.5

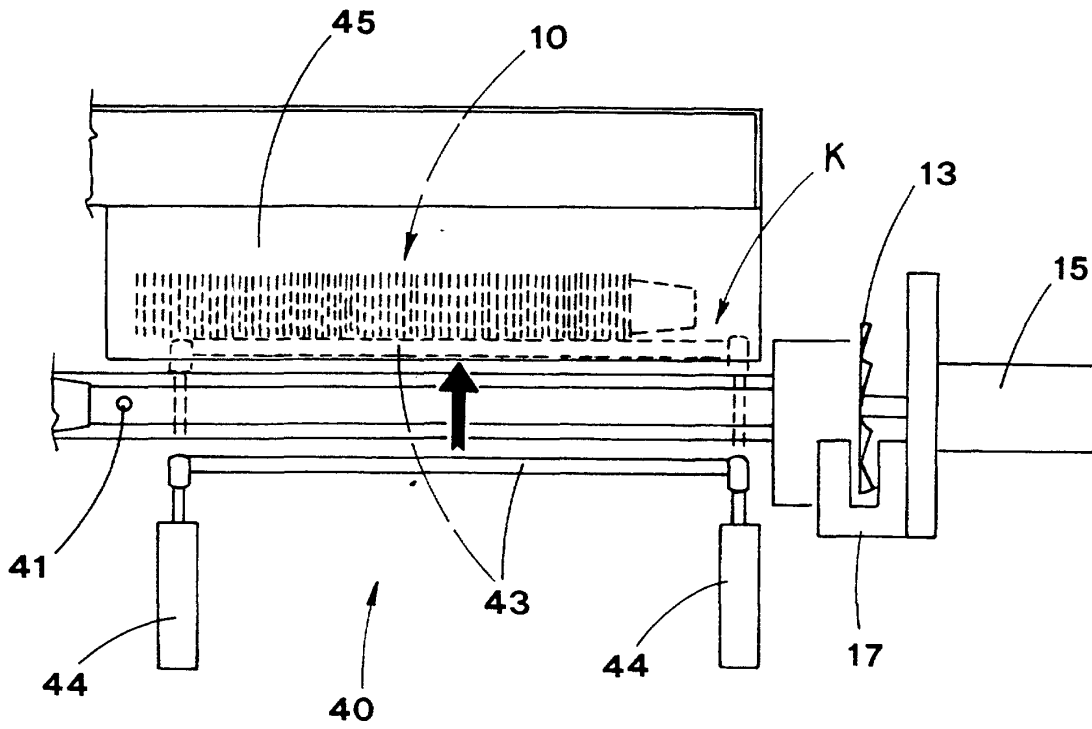
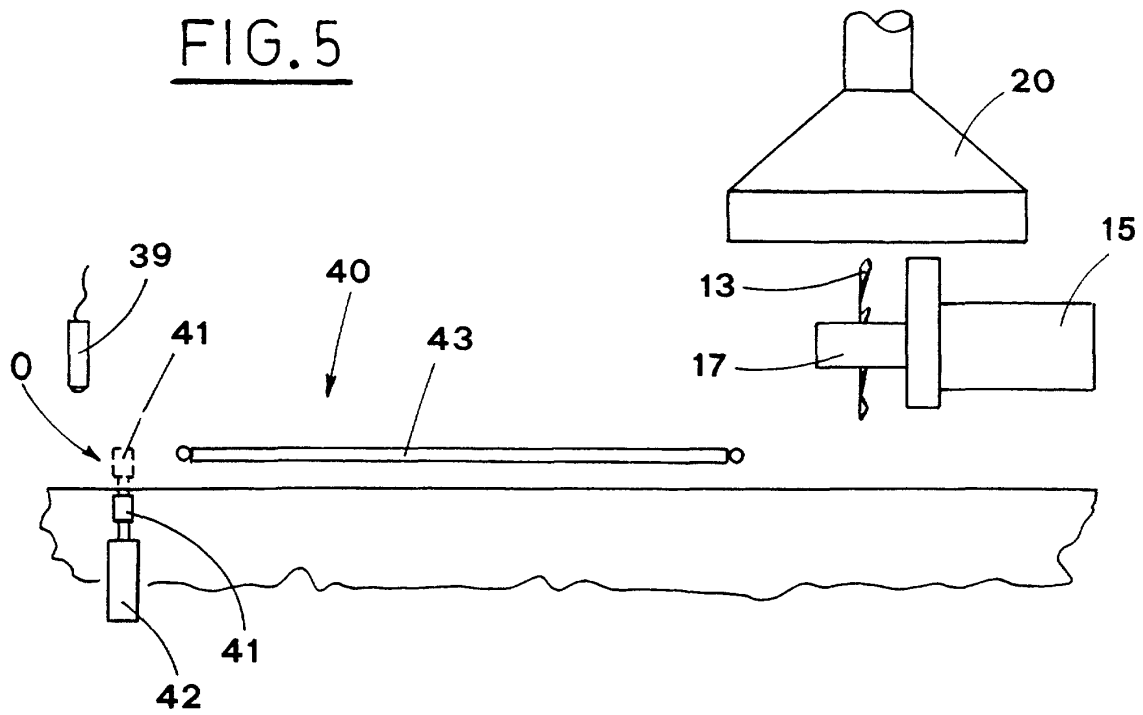


FIG.4

FIG. 6

