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(54) **Device for transporting packages of lap and empty tubes**

Transporteinrichtung für Wattewickel und leere Hülsen

Dispositif pour transporter enroulements de nappe et bobines vides

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(73) Proprietor: **MASCHINENFABRIK RIETER AG**
CH-8406 Winterthur (CH)

(72) Inventors:
- **Buzziolo, Sandro**
  I-33100 Udine (IT)
- **Lancerotto, Fabio**
  I-20131 Milano (IT)
- **Gerin, Umberto**
  I-33170 Pordenone (IT)

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Description

[0001] This invention concerns a device for the automatic feed of textile machines and, in particular, of combing machines. To be more exact, the invention concerns a device for the automatic withdrawal of a plurality of lap packages packaged on lap production machines, the conveying of the lap packages to the neighbourhood of the combing machines and the discharge of such packages in the zone of feed of the combing heads.

[0002] The device provides also for the automatic withdrawal of the empty tubes for the lap from the combing machines and the conveying and automatic discharge of the tubes at the required positions.

[0003] The device is suitable to feed a plurality of combing machines and also to serve one or more lap production machines.

[0004] The problems linked to the feed of combing machines with packages of lap are known in the textile industry. These packages of lap are produced on appropriate machines and, after being packaged, are discharged from those machines automatically in a storage zone forming part of the machines themselves and are withdrawn thence one by one or in groups.

[0005] These lap packages cannot be moved by hand by the machine operators or by the operators of the transport means as they may weigh more than 20 kilos each.

[0006] In the state of the art the withdrawal of the lap packages from their production machines and their transport to the combing machines are normally carried out by trolleys able to run on the floor and moved by their operator by hand, the trolleys generally holding a plurality of lap packages.

[0007] Some lay-outs of an overhead type able to convey one lap package at a time and actuated by hand or automatically have been proposed.

[0008] An arrangment for transporting packages of lap and empty tubes between a lap producing machine and combing machines is known from the DE-A-1.288.490.

[0009] The DE-A-1.288.490 discloses an overhead transportation system for single laps, by means of an overhead transfer device, from lap producing machines to combing machines. The system in the form of a trolley has the sole purpose of temporary storing laps while waiting for same to be taken up by the overhead transfer device. The trolley is movable cross-wise and step-wise in relation to the lap producing machine by a distance that is equal to about the width of three laps. The trolley has the purpose of positioning the stored laps in the proper lifting position, which lifting is carried out by a lifting device such that said lap can be taken up by the transfer device.

[0010] The purpose of said trolley is not one of transporting and transferring laps and empty tubes from a lap producing machine to a combing machine. Reference is neither made to the manner of transferring the laps to the combing machine, nor to the transfer of empty tubes from the combing machine to the lap producing machine.

[0011] All these lay-outs entail a plurality of drawbacks as regards finance where manpower has to be employed (manual systems), or as regards the space taken up (overhead systems), or as regards safety since considerable weights may have to be suspended (overhead systems), or as regards product quality since there is a risk of dirtying or ruining the packages being conveyed (overhead systems).

[0012] The present applicant has studied, tested and obtained a device able to overcome all the problems of the state of the art.

[0013] The invention is set forth in the main claims 1, 2 and 9, while the dependent claims describe various features of the invention.

[0014] An arrangement for transporting packages of lap and empty tubes between a lap producing machine and combing machines is proposed with:

- a lap production machine with a discharge unit for discharging the produced packages of lap and with a storage unit for receiving empty tubes;
- a trolley having a control and a drive unit for automatically guiding the trolley on the floor and a collecting container for receiving a plurality of packages of laps, a collecting container for collecting empty tubes and loading/unloading means for laps and empty tubes;
- combing machines with storage zones for receiving packages of laps and collecting units for empty tubes.

[0015] Further an arrangement for transporting packages of lap and empty tubes between a lap producing machine and combing machines is proposed in that it comprises a trolley with a control and a drive unit for automatically guiding the trolley on the floor and for exactly moving to a predeterminated position for loading and unloading packages of laps or empty tubes, said trolley being equipped with a collecting container for receiving a plurality of packages of laps in a systematic manner and further equipped with an appropriate container adapted for automatically collecting empty tubes from each of the combing machines and for automatically discharging the collected tubes to the lap production machine.

[0016] It is advantageously when the control unit of the trolley is connected with a central data processing unit conversing with the trolley and receiving information as to everything taking place in the network connecting the devices by a communication system.

[0017] The collection container may hold a required number of lap packages, which is generally equal to, or a multiple or submultiple of, the number of combing heads.

[0018] The guide system is advantageously of a type

operated by a magnetic guide wire.

[0019] It is known that a trolley of the type operated by a magnetic guide wire is operated by a magnetic field generated by a wire sunk at a small depth in the floor and traversed by a weak current.

[0020] Other wires enable instructions to be given to the trolley through a suitable combination of frequencies, while a broad freedom of combining plants and interfaces can be achieved at the same time.

[0021] The employment of a trolley operated by a magnetic guide wire according to the invention enables the lap packages thus taken to be conveyed to the combing machines requiring a supply of lap along required routes.

[0022] The trolley can follow pre-set routes or can travel to the combing machines which require it; it can also serve one or more lap production machines.

[0023] As further claimed the trolley can comprise a body bearing a collection container for the packages of lap wherein the container can have a movable sidewall.

[0024] The body can be mounted on a base, wherein the base can contain control units, batteries, drive motors and steering motors.

[0025] Further a trolley for transporting packages of laps and empty tubes between a lap producing machine and combing machines is proposed wherein it comprises a base provided with a control and a drive unit, with batteries, motors and steering motors for automatically guiding the trolley on the floor and a body on the base, a container for packages of laps and an appropriate container for automatically collecting empty tubes on the body and loading/unloading means for laps and empty tubes.

[0026] The attached figures, which are given as a non-restrictive example, show the following:

Fig.1 shows a diagram of a front of a lap production machine;
Fig.2 shows a three-dimensional diagram of a trolley employed in the device of the invention;
Fig.3 shows a possible lay-out according to the invention;
Fig.4 shows another lay-out according to the invention.

[0027] Fig.1 shows a diagram of a lap drawing frame 10 of the state of the art, in which fibres 11 coming from feeder creels converge on three drawing heads 12 and are then combined and collected on lap packages 13 in a collection unit 14.

[0028] The collection unit 14 packages one lap package 13 at a time and then discharges it automatically into a discharge unit 15 forming part of the lap drawing frame 10.

[0029] When the lap package 13 has been discharged, the process starts again automatically and may have available an incorporated feed of empty tubes 16 for lap packages 13.

[0030] The lap packages 13 are discharged by the collection unit 14 one after another in series into the discharge unit 15, whence they may be removed in turn by hand or automatically.

[0031] A number of lap packages 13 equal to, or a multiple or submultiple of, the number of the heads of the combing machines 17 positioned downstream can be normally held in the discharge unit 15.

[0032] The device according to the invention provides for the use of a trolley 18, advantageously of a type guided by a magnetic guide wire, which is suitable to take the lap packages 13 held in the discharge unit 15 automatically and to convey them to the combing zone.

[0033] The trolley 18 possesses a body 19 suitable to bear a collection container 20 in which the lap packages 13 are arranged in an orderly manner in a number equal to, or a multiple or submultiple of, the number of heads of a combing machine 17.

[0034] A base 21 of the trolley 18 normally holds the control units of the trolley, the batteries, the drive motors and motors to steer the motive wheels.

[0035] The collection container 20 has a movable sidewall 22 which can be moved by jacks 23 for the loading or unloading of lap packages 13.

[0036] When the lap packages 13 have been loaded at the discharge unit 15 of the lap drawing frame 10 being served, the trolley 18 is sent to the department of the combining machines along pre-set routes or as called for by the combing machines 17.

[0037] The operations of the trolley 18 can be centralized, whereby a central unit is informed by a communication system concerning everything taking place in the network and determines the movement of the trolley according to the information received.

[0038] The operation of the trolleys 18 can also be decentralized, whereby the trolleys by themselves are able to perform the majority of the typical functions of the central unit described above.

[0039] When the trolley 18 has reached the pre-selected combing machine 17, it discharges the lap packages 17 in an orderly manner by means of its movable sidewall 22 and the jacks 23 in a storage zone on the combing machine 17 in a position corresponding exactly with the loading of the lap packages 13 on the combing heads.

[0040] Before starting its return travel to the lap drawing frame 10, the trolley 18 may collect the empty tubes 16 of the lap packages 13 automatically in an appropriate container on the trolley in cooperation with a collection point on the combing machine 17 and may discharge those tubes 16 thereafter in an appropriate storage station or in correspondence with the lap drawing frame 10.

[0041] Fig.3 shows a diagram of a possible lay-out whereby a trolley 18 serves a lap drawing frame 10 and eight combing machines 17 arranged two by two in parallel. In this case the trolley 18 serves the combing machines 17 by carrying out an endless circuit.

[0042] Fig.4 shows a case in which the trolley 18 can serve two lap drawing frames 10 and twelve combing machines 17, the latter being arranged in parallel. In the case of Fig.4 the trolley 18 will follow straight routes in serving the combing machines 17.

Claims

1. Arrangement for transporting packages of lap (13) and empty tubes (16) between a lap producing machine (10) and combing machines (17), said arrangement being characterized in that it comprises:

   - a lap production machine (10) with a discharge unit (15) for discharging the produced packages of lap (13) and with a storage unit for receiving empty tubes (16);
   - a trolley (18) having a control and a drive unit for automatically guiding the trolley on the floor and a collecting container (20) for receiving a plurality of packages of laps (13), a collecting container for collecting empty tubes (16) and loading/unloading means for laps (13) and empty tubes (16);
   - combing machines (17) with storage zones for receiving packages of laps (13) and collecting units for empty tubes (16).

2. Arrangement for transporting packages of lap (13) and empty tubes (16) between a lap producing machine (10) and combing machines (17), said arrangement being characterized in that it comprises a trolley (18) with a control and a drive unit for automatically guiding the trolley on the floor and for exactly moving to a predeterminated position for loading and unloading packages of laps or empty tubes (13, 16), said trolley (18) being equipped with a collecting container (20) for receiving a plurality of packages of laps (13) in a sytematic manner and further equipped with an appropriate container adapted for automatically collecting empty tubes (16) from each of the combing machines (17) and for automatically discharging the collected tubes to the lap production machine (10).

3. Arrangement as claimed in claim 1 or 2, in which the control unit of the trolley (18) is connected with a central data processing unit conversing with the trolley (18) and receiving information as to everything taking place in the network connecting the devices by a communication system.

4. Arrangement according to claim 1 or 2, in which the guide system between the combing machines (17) and the lap producing machine (10) comprises a magnetic guide wire.

5. Arrangement according to claim 2, in which the trolley (18) comprises a body (19) bearing a collection container (20) for the packages of lap (13).

6. Arrangement according to claim 5, wherein the container (20) has a movable sidewall (22).

7. Arrangement according to claim 5 or 6, wherein the body (19) is mounted on a base (21).

8. Arrangement according to claim 7, wherein the base (21) contains control units, batteries, drive motors and stearing motors.

9. A trolley for transporting packages of laps (13) and empty tubes (16) between a lap producing machine (10) and combing machines (17), characterized in that it comprises a base (21) provided with a control and a drive unit, with batteries, motors and steering motors for automatically guiding the trolley on the floor and a body (19) on the base (21), a container (20) for packages of laps (13) and an appropriate container for automatically collecting empty tubes on the body (19) and loading/unloading means for laps (13) and empty tubes (16).

Patentansprüche

1. Anordnung zum Transportieren von Wickelpackungen (13) und leeren Hülsen (16) zwischen einer Wickelmaschine (10) und Kämmmaschinen (17) **dadurch gekennzeichnet,** dass in dieser Anordnung enthalten sind, eine Wickelmaschine (10) mit einer Entladeeinheit (15) zum Entladen der fertigen Wickelpackungen (13) und mit einer Lagereinheit zur Aufnahme leerer Hülsen(16), einen Wagen (18) mit einer Steuer- und Antriebseinheit für das automatische Führen des Wagens entlang der Bodenfläche und einen Sammelbehälter (20) zur Aufnahme einer Vielzahl von Wickelpackungen (13), einen Sammelbehälter zum Sammeln von leeren Hülsen (16), sowie Lade- und Entlademittel für Wickelpakkungen (13) und leeren Hülsen (16), Kämmmaschinen mit Lagerbereichen zur Aufnahme von Wickelpackungen (13) und Sammeleinheiten für leere Hülsen (16).

2. Anordnung zum Transportieren von Wickelpackungen (13) und leeren Hülsen (16) zwischen einer Wickelmaschine (10) und Kämmmaschinen (17) **dadurch gekennzeichnet,** dass in dieser Anordnung enthalten sind, ein Wagen (18) mit einer Steuer- und Antriebseinheit für das automatische Führen des Wagens entlang der Bodenfläche und zur genauen Hinführung an eine vorbestimmte Position für das Laden und Entladen von Wickelpackungen oder leeren Hülsen (13,16), wobei der Wagen (18)

mit einem Sammelbehälter (20) zur systematischen Aufnahme einer Vielzahl von Wickelpackungen (13) ausgerüstet ist, und wobei der Wagen ferner einen passenden Behälter zum automatischen Aufnehmen von leeren Hülsen (16) von jeder dieser Kämmmaschinen (17) und für deren automatische Abgabe an die Wickelmaschine (10) aufweist.

3. Anordnung gemäss der Ansprüche 1 oder 2, **dadurch gekennzeichnet,** dass die Steuereinheit für den Wagen (18) mit einer zentralen Datenverarbeitungseinheit verbunden ist, zwecks Informationsaustausch sowie Informationsempfang bezüglich aller Abläufe innerhalb des Netzwerkes, welches die Vorrichtung mit dem Kommunikationssystem verbindet.

4. Anordnung gemäss der Ansprüche 1 oder 2, **dadurch gekennzeichnet,** dass das Leitsystem zwischen den Kämmmaschinen (17) und der Wickelmaschine (10) einen magnetischen Leitdraht aufweist.

5. Anordnung gemäss Anspruch 2, **dadurch gekennzeichnet,** dass der Wagen einen Körper (19) umfasst, welcher einen Aufnahmebehälter (20) für Wickelpackungen (13) trägt.

6. Anordnung gemäss Anspruch 5, **dadurch gekennzeichnet,** dass der Behälter (20) eine bewegliche Seitenwand (22) aufweist.

7. Anordnung gemäss Anspruch 5 oder 6, **dadurch gekennzeichnet,** dass der Körper (19) auf dem Basisteil (21) befestigt ist.

8. Anordnung gemäss Anspruch 7, **dadurch gekennzeichnet,** dass im Basisteil (21) Steuereinheiten, Batterien, Antriebsmotoren und Lenkmotoren enthalten sind.

9. Ein Wagen zum Transportieren von Wickelpackungen (13) und leeren Hülsen (16) zwischen einer Wickelmaschine (10) und Kämmmaschinen (17) **dadurch gekennzeichnet,** dass dieser Wagen einen Basisteil (21) aufweist, welcher mit einer Steuer- und Antriebseinheit mit Batterien und Motoren und Lenkmotoren zum automatische Führen des Wagens über die Bodenfläche ausgerüstet ist, und einem Körper (19) auf dem Basisteil (21), einen Behälter (20) für Wickelpackungen (13) sowie einen passenden Behälter zum automatischen Sammeln leerer Hülsen auf diesem Körper (19), sowie Lade- und Entlademittel für die Wickelpackungen (13) und leeren Hülsen (16).Titel

Revendications

1. Arrangement servant à transporter des rouleaux de nappe (13) et des fuseaux vides (16), entre une réunisseuse de rubans (10) et des peigneuses (17), caractérisé par le fait que
cet arrangement comprend, une réunisseuse de rubans (10) avec une unité de déchargement (15) servant à décharger les rouleaux de nappe terminés (13) et avec une unité de stockage pour la réception de fuseaux vides (16), un chariot (18) avec une unité de commande et d'entraînement pour le guidage automatique du chariot le long de la surface du sol, et un récipient collecteur (20) pour la réception d'une pluralité de rouleaux de nappe (13), un récipient collecteur pour rassembler des fuseaux vides (16), ainsi que des moyens de chargement et de déchargement pour les rouleaux de nappe (13) et les fuseaux vides (16), peigneuses possédant des zones de stockage pour la réception des rouleaux de nappe (13) et des unités collectrices pour les fuseaux vides (16).

2. Arrangement servant à transporter des rouleaux de nappe (13) et des fuseaux vides (16), entre une réunisseuse de rubans (10) et des peigneuses (17), caractérisé par le fait que
cet arrangement comprend, un chariot (18) avec une unité de commande et d'entraînement pour le guidage automatique du chariot le long de la surface du sol et pour le guidage précis vers une position prédéterminée, pour le chargement et le déchargement de rouleaux de nappe ou de fuseaux vides (13, 16), et où le chariot (18) est équipé d'un récipient collecteur (20) pour la réception systématique d'une pluralité de rouleaux de nappe (13), et où le chariot possède, en plus, un récipient approprié pour la réception automatique de fuxeaux vides (16) venant de chacune de ces peigneuses (17), et pour la distribution automatique de ceux-ci à la réunisseuse de rubans (10).

3. Arrangement selon les revendications 1 ou 2, caractérisé par le fait que
l'unité de commande pour le chariot (18) est reliée avec une unité de traitement de données centrale, dans le but d'échanger des informations ainsi que de réceptionner des informations concernant tous les déroulements à l'intérieur du réseau qui relie le dispositif avec le système de communications.

4. Arrangement selon les revendications 1 ou 2, caractérisé par le fait que
le système de guidage entre les peigneuses (17) et la réunisseuse de rubans (10) comprend un fil directeur magnétique.

5. Arrangement selon revendication 2,

caractérisé par le fait que
le chariot comprend un corps (19) qui porte un récipient collecteur (20) pour les rouleaux de nappe (13).

6. Arrangement selon revendication 5,
caractérisé par le fait que
le récipient (20) possède une paroi latérale mobile (22).

7. Arrangement selon revendication 5 ou 6,
caractérisé par le fait que
le corps (19) est fixé sur la partie de base (21).

8. Arrangement selon revendication 7,
caractérisé par le fait que
des unités de commande, des batteries, des moteurs d'entraînement et des moteurs de manoeuvre sont contenus dans la partie de base (21).

9. Un chariot servant à transporter des rouleaux de nappe (13) et des fuseaux vides (16) entre une réunisseuse de rubans (10) et des peigneuses (17), caractérisé par le fait que ce chariot possède, une partie de base (21) laquelle est équipée avec une unité de commande et d'entraînement comprenant des batteries et des moteurs et des moteurs de manoeuvre pour le guidage automatique du chariot sur la surface du sol, et un corps (19) sur la partie de base (21), un récipient (20) pour les rouleaux de nappe (13), ainsi qu'un récipient approprié pour collecter automatiquement les fuseaux vides sur ce corps (19), ainsi que des moyens de chargement et de déchargement pour les rouleaux de nappe (13) et les fuseaux vides (16).

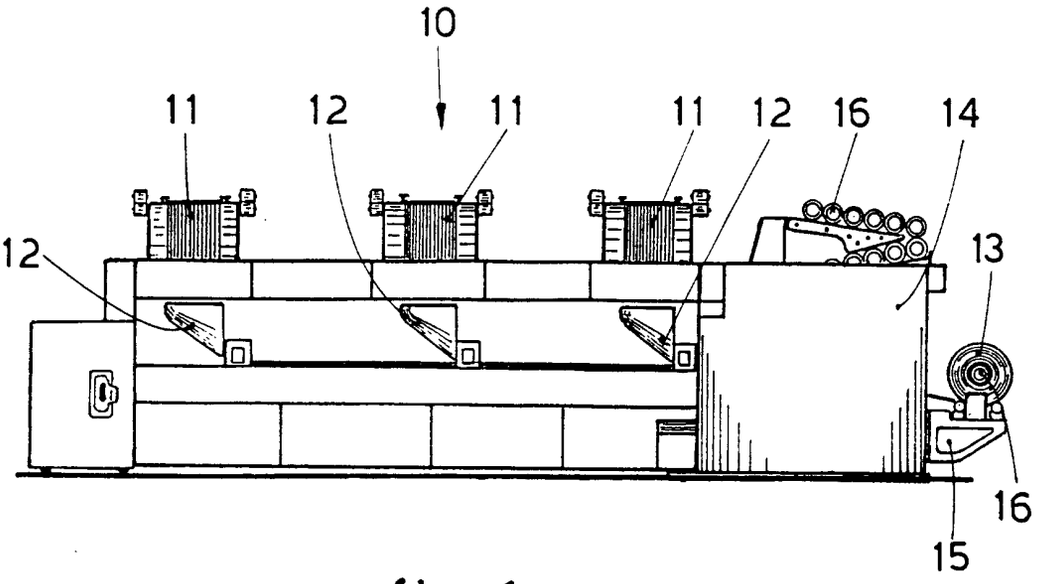

fig.1

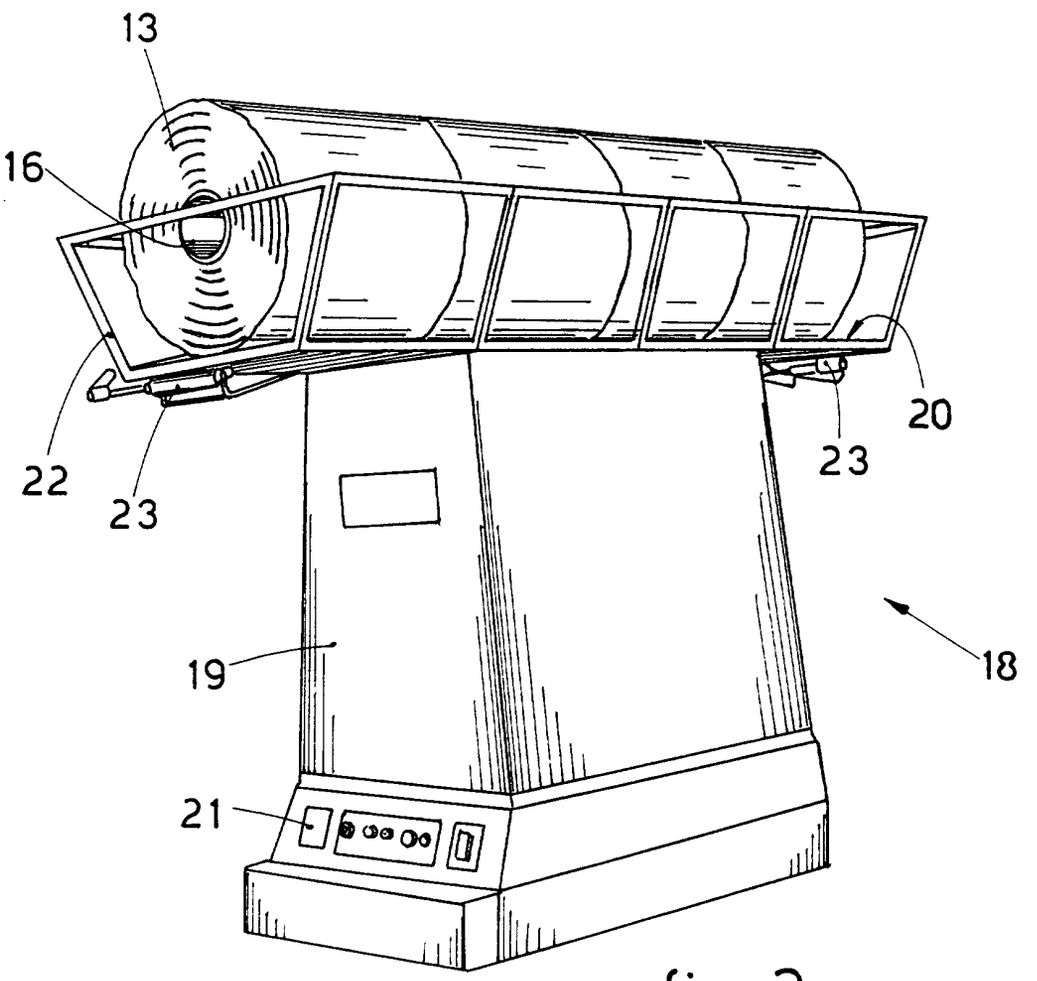

fig.2

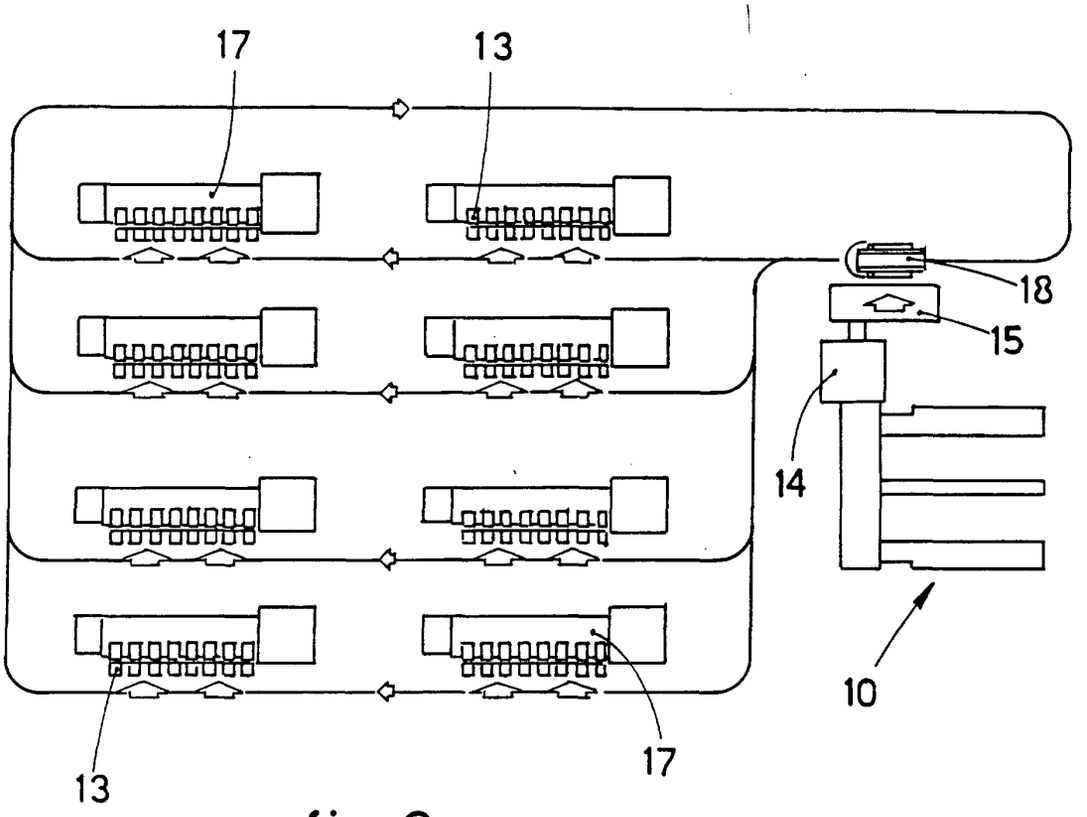

fig.3

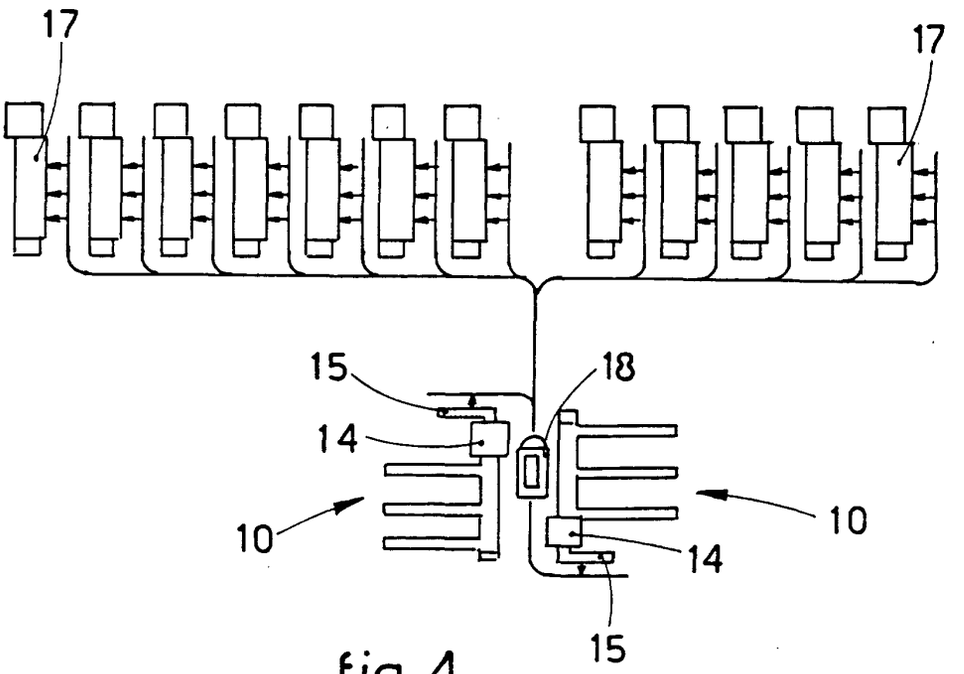

fig.4