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(54) **Method for the automatic feed of combing machines.**

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Description

This invention concerns a method for the automatic feed of textile machines and, in particular, of combing machines. To be more exact, the invention concerns a method which arranges 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.

The method 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.

The method is suitable to feed a plurality of combing machines and also to serve one or more lap production machines.

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are discharged from those machines automatically in a storage zone forming part of the machines themselves and are withdrawn thence one by one or in groups.

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.

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.

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.

The solution of EP-A-118600 discloses an overhead conveyor system wherein the automatic conveying packages and empty tubes are confined to a more or less automatic transport motion of individual rail suspended carriers each carrying one package and operated in groups; the conveying of empty tubes to the conveyor system from the lap package producing machine still takes place by hand and not automatically.

The solution of DE-B-1.288.490 discloses an overhead conveyor system for lap packages which is equipped with grippers guided individually on a system of rails for conveying the lap packages from the package feeder to the heads of the combing machine. The trolley shown in DE-B-1.288.490 performs only a buffer function for the machine processing lap packages.

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

The present applicant has conceived the method able to overcome the drawbacks referred to above as set forth in Claim 1, while the dependent claims describe special embodiments of the invention.

The method provides for use a trolley comprising a container to collect the lap packages and also another container for collection of empty tubes.

The packages are positioned in an orderly manner in the container according to the arrangement whereby they will feed the combing heads.

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.

The trolley is of a type operated by a magnetic guide wire which generates a magnetic field. The wire is sunk at a small depth in the floor and traversed by a weak current.

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

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.

The lap packages are discharged automatically in an orderly manner from the collection container of the trolley at a storage zone corresponding to the combing heads. They will be put thereafter by the machine operator in a position to feed the heads.

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.

According to a variant the trolley can take empty tubes for lap automatically from an appropriate collection zone on the combing machine and can convey them to a storage zone served by the trolley or corresponding to the lap production machines.

This automatic withdrawal of empty tubes can be carried out at the same time as the discharge of lap packages on the combing machine.

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 or a trolley employed in the method of the invention;

Fig.3 shows a possible lay-out according to the invention;

Fig.4 shows another lay out according to the invention.

Fig.1 shows a diagram of a lap drawing frame 10 or 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.

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.

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.

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.

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.

The method 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.

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.

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.

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.

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.

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.

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.

When the trolley 18 has reached the pre-selected combing machine 17, it discharges the lap packages 13 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.

Before starting its return travel to the lap drawing frame 10, the trolley 18 may collect the empty tubes 16 or 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.

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.

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. Method to feed packages of lap (13) produced by a lap production machine (10) to combing machines (17), characterized by comprising the step of automatically taking a plurality of packages (13) in a systematic manner from a lap production machine (10) to a trolley (18), said trolley (18) having a package collection container (20) for receiving the plurality of packages (13) and being capable of moving on the floor, arranging said taken packages (13) in an orderly manner on said collection container (20), automatically and simultaneously conveying the arranged packages (13) by moving said trolley (18) to the combing machines (17), discharging the packages (13) systematically and automatically from the collection container (20) by said trolley (18) at positions suitable to feed the heads of the combing machines (17), automatically withdrawing empty tubes (16) for the packages (13) by the trolley (18) from the combing machines (17) and automatically collecting the tubes (16) in an appropriate container on the trolley (18) and, after its return travel, discharging the tubes (16) at an appro-

priate storage station or at the lap production machine by the trolley.

2. Method according to Claim 1, in which the trolley (18) moving on the floor is guided to the combing machines (17) along pre set routes. 5
3. Method as claimed in Claim 1, whereby the trolley (18) moving on the floor is guided by a magnetic guide wire. 10
4. Method as claimed in Claim 1, in which the discharge of the packages in an orderly manner is effected by means of a movable side wall (22) of the collection container (20). 15
5. Method as claimed in Claim 1, in which the number of lap packages (13) borne by the trolley (18) is equal to the number of combing heads of each combing machine (17) served. 20
6. Method as claimed in Claim 1, in which the number of lap packages (13) borne by the trolley (18) is a multiple or sub-multiple of the number of combing heads of each combing machine (17) served. 25
7. Method as claimed in Claim 1, in which the operations of the trolley (18) are determined by a central data processing unit in response to the information received from a communication system informed of everything taking place in the network. 30

Patentansprüche

1. Verfahren zum Zuführen von an einer Kämme-reivorbereitungsmaschine (10) hergestellten Wickeln (13) zu Kämmaschinen (17), gekennzeichnet durch automatisches und systematisches Beladen einer Mehrzahl von Wickeln (13) von einer Kämme-reivorbereitungsmaschine (10) in einen Transportwagen (18), der einen Wickel-Sammel-Container (20) zur Aufnahme der Mehrzahl von Wickeln (13) hat und in der Lage ist, auf dem Boden zu fahren, wobei die aufgenommenen Wickel (13) in geordneter Weise auf dem Sammel-Container (20) plaziert werden, die geordneten Wickel (13) automatisch und systematisch durch den fahrbaren Transportwagen (18) zur Kämmaschine (17) befördert werden, automatisches und systematisches Abgeben der Wickel (13) vom Sammel-Container (20) durch den Transportwagen (18) zu einer geeigneten Position, um die Köpfe der Kämmaschine (17) zu beschicken, automatisches Entfernen der leeren Hülsen (16) der Wickel (13) durch den Transportwagen (18) 35 40 45 50 55

von der Kämmaschine (17) und automatisches Sammeln der Hülsen (16) in einem geeigneten Container auf dem Transportwagen (18) und, nach seiner Rückfahrt, Abgabe der Hülsen (16) durch den Transportwagen an eine geeignete Aufnahmestelle oder an die Kämme-reivorbereitungsmaschine.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass der Transportwagen (18), der auf dem Boden fahren kann, entlang vorgegebenen Routen zu den Kämmaschinen (17) geleitet wird.
3. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass der Transportwagen (18), der auf dem Boden fahren kann, mittels eines magnetischen Leitdrahtes geführt wird.
4. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass das Entladen der Wickel (13) in geordneter Weise über eine bewegliche Seitenwand (22) des Sammel-Containers (20) erfolgt.
5. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass die Anzahl der vom Transportwagen (18) aufgeladenen Wickel (13) identisch ist mit der Anzahl der Kämmköpfe jeder bedienten Kämmaschine (17).
6. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass die Anzahl der vom Transportwagen (18) aufgeladenen Wickel (13) ein Mehrfaches oder Teilmehrfa-ches der Anzahl der Kämmköpfe jeder bedienten Kämmaschine (17) ist.
7. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass die Operationen des Transportwagens (18) durch eine zentrale Datenverarbeitungseinheit bestimmt werden, und zwar in Abhängigkeit von den Informationen, die von einem Kommunikationssystem empfangen werden, das über alle im Netz stattfindenden Ereignisse informiert ist.

Revendications

1. Procédé pour amener vers des peigneuses (17) des rouleaux de nappe (13), fabriqués par une machine de préparation au peignage (10), caractérisé par
 - le chargement automatique et systématique d'une pluralité de rouleaux de nappe (13), depuis une machine de préparation au peignage (10), dans un chariot de transport (18) qui possède un conteneur-

- collecteur de rouleaux de nappe (20) servant à la réception de la pluralité de rouleaux de nappe (13), et qui est à même de se déplacer sur le sol, et où les rouleaux de nappe réceptionnés (13) sont placés d'une manière ordonnée sur le conteneur-collecteur (20), et les rouleaux de nappe ordonnés (13) sont transportés automatiquement et systématiquement par le chariot de transport mobile (18) vers la peigneuse (17),
- la livraison automatique et systématique des rouleaux de nappe (13) par le chariot de transport (18), depuis le conteneur-collecteur (20) dans une position appropriée, afin d'alimenter les têtes de la peigneuse (17),
 - l'éloignement automatique des bobinots vides (16) des rouleaux de nappe (13) par le chariot de transport (18), depuis la peigneuse (17), et
 - la collecte automatique des bobinots (16) dans un conteneur approprié sur le chariot de transport (18) et, après son voyage de retour,
 - la livraison des bobinots (16) par le chariot de transport, dans un lieu de réception approprié, ou dans la machine de préparation au peignage.
2. Procédé selon revendication 1, caractérisé par le fait que le chariot de transport (18), mobile sur le sol, est guidé vers les peigneuses (17) le long de trajets prédéterminés.
3. Procédé selon revendication 1, caractérisé par le fait que le chariot de transport (18), mobile sur le sol, est guidé à l'aide d'un fil conducteur magnétique.
4. Procédé selon revendication 1, caractérisé par le fait que le déchargement des rouleaux de nappe (13) se fait d'une manière ordonnée, via une paroi latérale amovible (22) du conteneur-collecteur (20).
5. Procédé selon revendication 1, caractérisé par le fait que le nombre de rouleaux de nappe (13) chargés sur le chariot de transport (18), est identique au nombre de têtes de peignage de chaque peigneuse servie (17).
6. Procédé selon revendication 1, caractérisé par le fait que le nombre de rouleaux de nappe (13) chargés
- sur le chariot de transport (18), est un multiple ou un multiple partiel du nombre de têtes de peignage de chaque peigneuse servie (17).
7. Procédé selon revendication 1, caractérisé par le fait que les opérations réalisées par le chariot de transport (18) sont dictées par une unité centrale de traitement de données, et ceci en fonction des informations reçues par un système de communication qui est informé sur tous les événements ayant lieu dans le réseau.

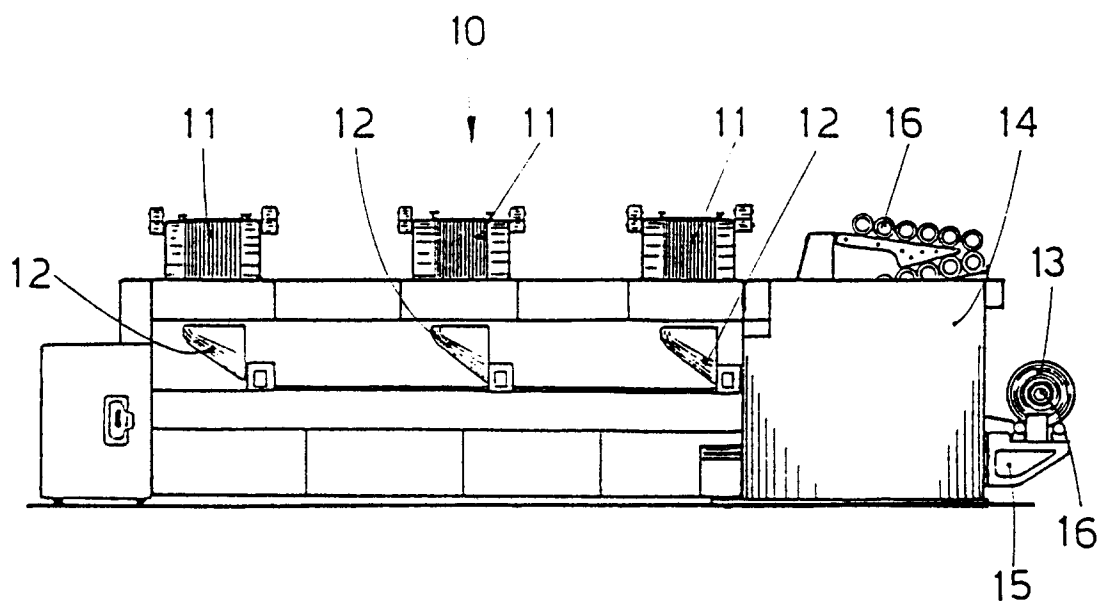


fig. 1

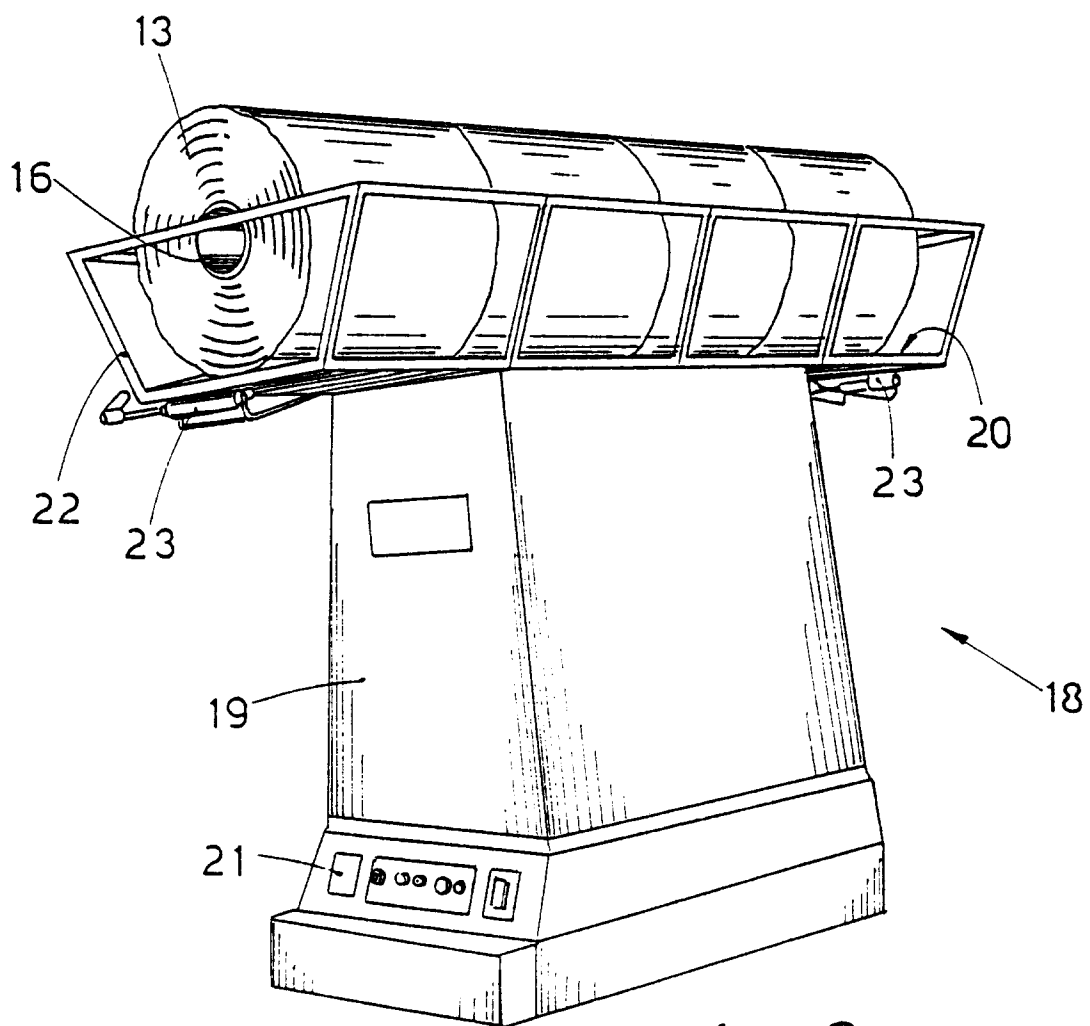


fig. 2

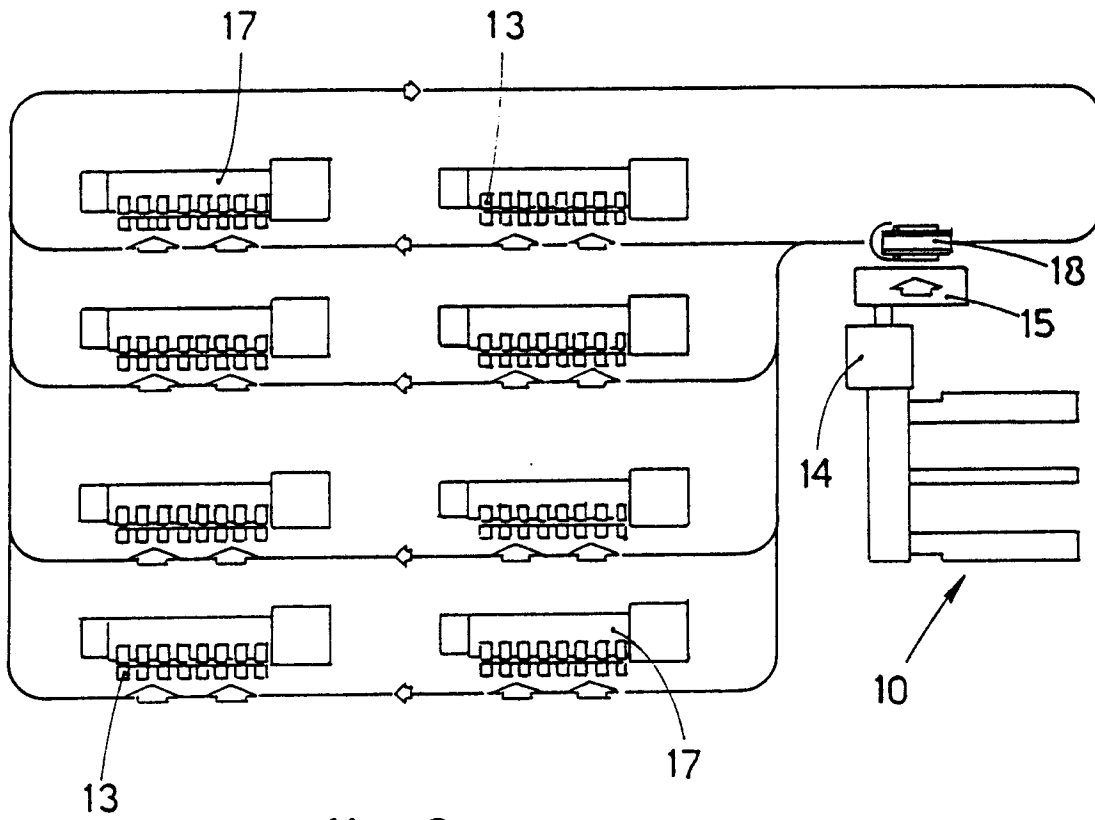


fig. 3

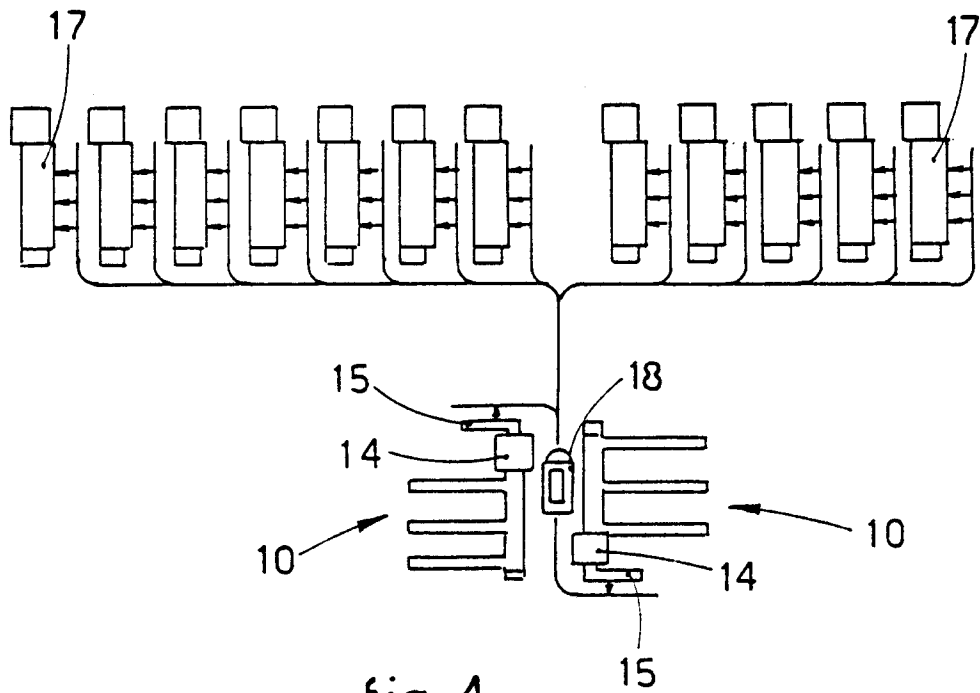


fig. 4