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(54) **Apparatus for loading and unloading fabric rolls onto spreading machines.**

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Description

Background of the Invention

The present invention relates to an apparatus for loading and replacing piece goods, or fabric rolls, effective to be associated with spreading machines of the type used in the clothes field.

As it is known, in the clothes industry the fabrics are spread, before the cutting, in superimposed layers in such a way as to form the so-called mattress.

In order to carry out that preliminary operation, suitable spreading machines are presently used, comprising an equipped turret effective to longitudinally slide along a table and bearing the piece to be spread.

Presently the replacing of the piece goods which are present on the movable turret is carried out manually and requires several tedious operations, and long operating times, thereby negatively affecting the cost of the manufactured fabric articles.

While recently devices have been constructed for semiautomatically carrying out the thereinabove mentioned piece replacing operations, these devices, on the other hand, are not fully satisfactory for the intended processing.

For example the GB Patent 2,023,201 discloses an apparatus for tentering clothes including a single fabric laying reciprocable carriage carrying the rolls of fabric to be deposited on a bench in tentered form, which carriage carries out both the fabric loading and unloading operations. Thus, owing to the provision of a single carriage, the operation of the apparatus is rather slow, with a consequent poor tentering efficiency.

Summary of the Invention

Accordingly, the task of the present invention is that of overcoming the thereinabove mentioned drawbacks by providing an apparatus for loading and unloading fabric rolls onto spreading machines, and able of carrying out the mentioned roll loading and unloading operations in a fully automatic way, that is without any manual processings, and with a high efficiency.

Within the above task, it is a main object of the present invention to provide an apparatus for loading and unloading fabric rolls onto spreading machines, which is capable of finding, selecting and preparing the roll to be loaded on the spreading machine, while the latter is operating.

Yet another object of the present invention is to provide an apparatus for loading and unloading fabric rolls which is effective to discharge the empty mandrel from the spreading machine and load a new piece according to a predetermined program.

Yet another object of the present invention is to provide an apparatus for loading and unloading fabric rolls which is effective to be associated with any spreading machine presently available.

According to the present invention, the thereinabove mentioned task and objects, as well as yet other objects which will become more apparent hereinafter, are achieved by an apparatus for loading and unloading fabric rolls onto a spreading machine, according to the main Claim the pre-characterizing features of which are disclosed in GB—A—2 023 201.

Advantageously the movements of the piece bearing carousel and of said carriages are controlled by programming means effective to preset the movements of the fabric rolls to be supplied, by causing said rolls to be displaced to the loading carriage end of stroke position.

Moreover, after having located the roll on that carriage, the carousel is driven in such a way as to bring the roll being spread balance supporting member to the proximity of the end of stroke position of the discharging carriage.

Brief Description of the Drawings

Further characteristics and advantages of the apparatus for loading and unloading fabric rolls onto spreading machines, according to the present invention, will become more apparent hereinafter from the following detailed description of a preferred embodiment thereof, being illustrated, by way of an indicative example, in the accompanying drawings, where:

Fig. 1 is a schematic view of the apparatus according to the present invention, as taken at one of the two shoulders of the carousel and of the piece loading device;

Fig. 2 is a front view of the carousel;

Fig. 3 is a front view of the piece loading device;

Fig. 4 is a partial perspective view of one shoulder of those same carousel and piece loading device;

Fig. 5 is a detail view of the mentioned carousel;

Fig. 6 illustrates the driving gears for driving one of the shoulders of the piece loading device; and

Fig. 7 illustrates, by a detail view, the carousel for discharging the mandrel, or piece rendering mandrel, at a position for receiving said mandrel from the turret of the piece spreading machine.

Description of the Preferred Embodiment

With reference to the figures of the accompanying drawings, the apparatus for automatically loading and replacing piece goods, effective to be associated with piece spreading machines, according to the present invention, comprises a vertically extending magazine or carousel 1, formed by two shoulders at the top and bottom portions thereof there are provided rotating gear wheel sets or assemblies 2, driven by a geared motor 3 through a driveshaft 4 and suitable transmission gear pairs 5.

The mentioned gear wheel sets are engaged with correspondng chain members 6 bearing, at even spacings, balance supporting members 7, effective to support the mandrel 8 in turn supporting the piece goods 9.

On one side of the mentioned carousel 1 there is located a piece loading device 10, comprising two shaped shoulders 11, whereon there are

provided two guide pairs 12 and 12', 13 and 13' respectively, which guides are differently slanted with respect to the horizontal direction and converging toward said shoulder edge opposite to said carousel.

Along the mentioned guide pairs corresponding carriages 14 and 15 are capable of sliding as driven by chain members indicated respectively at 16 and 17, which extend between end gear wheel pairs 18 and 18', 19 and 19'.

More specifically, the gear wheel pairs 18 and 19 are driven through chain members 20 and 21, by pignon pairs 22 and 23, coupled by transmission or driving shafts which latter are in turn driven through respective chain members 24 by corresponding geared motor sets 25.

The mentioned carriages 14 and 15 are provided with an elongated arm member, indicated respectively at 14' and 15', along one edge thereof a chain 2b is capable of sliding being affixed, at an intermediate point, 27, to a small bracket 28 rigid with one of the mentioned guides 12 and 13.

Said chain 26, in particular, bears two adjoining projecting small plates 29 which define an intermediate seat or housing 30 effective to receive one of the ends of the mandrels 8 bearing the piece goods.

Said small plates, owing to the chains being affixed at 27, are able of moving, jointly to the carriages 14 and 15, from one end to the other of the carriage arm members 14' and 15'.

By that approach, the mentioned small plates 29 are able of alternatively approaching one of the balance supporting members 7 of the carousel, and suitable supporting members 31 comprising roller pairs, one thereof is controlled for laterally moving, said rollers being supported by the movable turret or slide of a known piece spreading machine.

In actual practice, after having programmed the spreading sequence of the piece goods supported by the carousel, as the apparatus is started the mandrel of the first piece is located at the upper guides of the piece loading device, whereas the carriage 14 locates its arm provided with the small plates 29 in such a position as to be able of receiving said mandrel.

Then, after having engaged the piece, supplied by gravity, the carriage 14 is driven in such a way as to bring said small plates to the opposite end of its arm, thereby discharging the piece on the turret of the piece spreading machine.

Meanwhile, the carousel will have brought the second piece to be spread (as per program) to such a position effective to supply the piece loading device.

The carriage 14, after having discharged the first piece, returns for taking up the second and is driven to the intermediate position of the guides 12, 12', whereas the carriage 15 is driven to such a position as to be able of receiving, between said small plates 29 of the arm thereof, the mandrel which is to be discharged by the turret of the piece spreading machine.

Contemporaneously, the carousel rotates to bring the balance supporting member 7 supporting the piece being spread to the guides 13 and 13'.

As the mandrel, or piece rendering mandrel, has been discharged from the turret of the piece spreading machine on the carriage 15, the latter is driven as far as to reach the related balance support member, whereas the carriage 14 supplies the second piece to be spread to the turret.

After the discharging of the first mandrel from the support therefor, the carousel brings the subsequent piece to be spread at the guides 12, 12' in such a way as to load the carriage 14 again, which afterwards, will wait for the discharging of the second mandrel from the turret of the piece spreading machine.

Contemporaneously the carousel rotates in such a way to locate said second mandrel balance supporting member at said guides 13 and 13' and so on.

From the above disclosure and the figures of the accompanying drawings, there are self-evident the great functionality and use facility characterizing the apparatus for loading and replacing piece goods, effective to be associated with piece spreading machines, according to the present invention.

It should obviously be noted that the apparatus and making procedure therefore have been thereinabove described and illustrated only by way of an indicative example and only to demonstrate the main characteristics of the invention.

Accordingly modifications and variations can be brought in the disclosed apparatus, without departing from the scope of the invention as it is defined in the appended claims.

Claims

1. An apparatus for loading and unloading fabric rolls onto a fabric spreading machine, comprising a vertical carriage rotating magazine or carousel with a track having vertically extending paths and provided with free hanging supporting members, effective to support the ends of the mandrels of individual rolls and movable around the track, the carousel being located on a side of a loading device which comprises transfer means for transferring rolls from the carousel to a spreading machine loading/unloading station on the opposite side of the loading device to the carousel and for returning empty mandrels to the carousel from the loading/unloading station, the transfer means comprising respective rectilinear supply and return transfer paths converging towards the loading/unloading station, characterized in that the loading device includes two side members (12, 12'; 13, 13') supporting therebetween two carriages (14, 15) driven in synchronized reciprocating movements along the respective converging paths, each of said carriages (14, 15) carrying an arm member (14', 15') extending in the direction of movement and on whose periphery a first chain (26) is slidably mounted, said first chain (26) being fixed

relative to the side members (12, 13) and provided with two adjoining projecting small plates (29) for receiving therebetween the mandrel (8) of a roll to be loaded on the spreading machine or the mandrel to be discharged on said carousel, the arrangement being such that when carriage (14) is near the carousel the plates lie on either side of the track and when it is near the loading/unloading station they are positioned to supply or receive a mandrel to or from the station.

2. An apparatus according to the preceding claim, characterized in that said carousel (1) consists of two supports, one at the top and one at the bottom thereof on each of which there are provided rotating gear wheel assemblies (2) driven by a geared motor (3) through a driveshaft (4) and transmission first gear pairs (5), said gear wheel assemblies or sets (2) being engaged with respective carousel chain members (6) bearing, at equal distances, free-hanging supporting members (7) for supporting said roll mandrels (8).

3. An apparatus according to the preceding claims, characterized in that on the side members of the loading device (10), there are provided two guide pairs (12, 12'; 13, 13'), said guides being differently slanted with respect to the vertical direction and converging toward the edge of said side members opposite to said carousel (1) and along which move the respective carriages (14, 15) driven by second chain members (16, 17) operated by second gear wheel pairs (18, 18'; 19, 19').

4. An apparatus according to the preceding claims, characterized in that said second gear wheel pairs (18, 18'; 19, 19') are driven, through respective third chain members (20, 21), by pignon pairs (22, 23) as coupled by transmission shafts which latter are in turn driven, by means of further chain members (24), by corresponding second gear motor sets (25).

5. An apparatus according to the preceding claims, characterized in that said first chain (26) is affixed, at an intermediate point (27) thereof, to a bracket member (28) rigid with one of said guides (12, 13).

6. An apparatus according to the preceding claims, characterized in that it comprises programming means effective to preset the movement sequence of said rolls on said carousel (1), in such a way as to cause said rolls to be displaced to the end of stroke position of one of said carriages (14, 15) and effective to cause said carousel (1) to be displaced, after the loading of the piece on said carousel (14), in such a way as to bring the free-hanging supporting member (7) of the roll being spread on said spreading machine to the proximity of the end of stroke position of the other said carriage (15).

Patentansprüche

1. Gerät zum Auf- und Abladen von Geweberollen auf eine Gewebeausbreitmaschine, mit einem drehbaren Magazin bzw. Karussel, welches mit senkrechten Fahrgestellen und einer Fahrbahn versehen ist, die senkrecht verlaufende Strecken aufweist und mit frei hängenden, die Spindelenden von einzelnen Rollen lagernden und sich um die Fahrbahn bewegenden Trägerorganen versehen ist, wobei das Karussel auf einer Seite einer Aufladevorrichtung angeordnet ist, welche Fördereinrichtungen zum Bedfördern von Rollen von dem Karussel zu einer Auf- und Abladestation der Ausbreitmaschine auf der dem Karussel entgegengesetzten Seite der Aufladestation und zum Rückfördern von leeren Spindeln von der Auf- und Abladestation zum Karussel aufweist, wobei die Fördereinrichtungen jeweilige geradlinige, gegen die Auf- und Abladestation zusammenlaufende Speisungs- und Zurückförderstrecken umfaßt, dadurch gekennzeichnet, daß die Aufladevorrichtung zwei Seitenteile (12, 12'; 13, 13') aufweist, welche zwischen sich zwei mit abgestimmten Hin- und Herbewegungen entlang den jeweiligen zusammenlaufenden Strekken angetriebene Fahrgestelle (14, 15) lagern, wobei jedes der Fahrgestelle (14, 15) einen sich in der Bewegungsrichtung erstreckenden Armteil (14', 15') trägt, an dessen Umfang eine erste Kette (26) gleitbar angebracht ist, wobei die erste Kette (26) mit den Seitenteilen (12, 13) fest verbunden ist und mit zwei nebenaneinanderliegenden vorstehenden Plättchen (29) versehen ist, welche zwischen sich die Spindel (8) einer auf die Ausbreitmaschine aufzuladenden Rolle bzw. die auf das Karussel abzuladende Spindel unterbringen, wobei die Anordnung derart ist, daß, wenn sich ein Fahrgestell (14) in der Nähe des Karussels befindet, die Plättchen auf einer Seite der Fahrbahn angeordnet sind und, wenn sich das Fahrgestell in der Nähe der Auf- und Abladestation befindet, sie zur Speisung oder Aufnahme einer Spindel zur bzw. von der Station angeordnet sind.

2. Gerät nach dem vorhergehenden Anspruch, dadurch gekennzeichnet, daß das Karussel (1) aus zwei Lagern besteht, wobei ein der Lager an dessen Oberseite und das andere an dessen Boden angeordnet ist und auf jedem Lager drehende Zahnradgruppen (2) vorgesehen sind, welche durch einen Zahnradmotor (3) über eine Antriebswelle (4) und ein erstes Übertragungszähnräderpaar (5) angetrieben ist, wobei die Zahnradgruppen oder -sätze (2) mit entsprechenden Karusselkettenelementen (6) in Eingriff sind, welche an gleichbleibenden Abständen frei hängende Trägerorgane (7) zum Lagern der Rollenspindeln (8) haltern.

3. Gerät nach den vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß auf den Seitenteilen der Aufladevorrichtung (10) zwei Führungspaare (12, 12'; 13, 13') vorgesehen sind, welche Führungen eine verschiedene Neigung zur senkrechten Richtung aufweisen und gegen die dem Karussel (1) entgegengesetzte Kante der Seitenteile zusammenlaufen und entlang welchen sich die jeweiligen Fahrgestelle (14, 15) bewegen, welche durch zweite, von zweiten Zahnräderpaaren (18, 18'; 19, 19') betätigte Kettenelemente (16, 17) angetrieben sind.

4. Gerät nach den vorhergehenden Ansprü-

chen, dadurch gekennzeichnet, daß die zweiten Zahnräderpaare (18, 18'; 19, 19') über jeweilige, dritte Kettenelemente (20, 21) durch Ritzelpaare (22, 23) angetrieben sind, die durch Übertragungswellen gekoppelt sind, welch letztere ihrerseits mittels weiterer Kettenelemente (24) durch entsprechende zweite gezahnte Motorsätze (25) angetrieben sind.

5. Gerät nach den vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß die erste Kette (26) bei einem mittleren Punkt (27) an einem mit einer der Führungen (12, 13) fest verbundenen Konsoleelement (28) befestigt ist.

6. Gerät nach den vorhergehenden Ansprüchen, gekennzeichnet durch Programmiereinrichtungen, welche befähigt sind, die Bewegungsfolge der Rollen auf dem Karussel (1) derart vorzubestimmen, daß die Rollen zum Ende der Hublage eines der Fahrgestelle (14, 15) versetzt sind, und befähigt sind, das Karussel (1) nach der Aufladung eines Stückes auf das Fahrgestell (14) derart zu versetzen, daß die frei hängenden Trägerorgane (7) der Rolle auf der Ausbreitmaschine in der Nähe des Endes der Hublage des anderen der Fahrgestelle (15) ausgebreitet werden.

Revendications

1. Appareil pour le chargement et dechargement de rouleaux de tissu sur une machine pour l'étalement de tissu, comprenant un magasin ou carrousel tournant à chariot vertical avec une piste ayant des parcours s'étendant verticalement et pourvue d'éléments de support suspendu librement, aptes à supporter les extremités des mandrins de rouleaux individuaux et apte à être déplacés autour de la piste, ledit carrousel étant positionné sur un côté d'un dispositif de chargement lequel comprend des moyens de transfert pour transferer des rouleaux du carrousel à une station de chargement/déchargement de la machine d'étalement sur le côté opposé du dispositif de chargement audit carrousel et pour returner des mandrins vides au carrousel de la station de chargement/déchargement, le moyens de transfert comprenant des respectifs parcours de transfert d'alimentation et de return rectilignes convergent vers la station de chargement/déchargement, caractérisé en ce que le dispositif de chargement comprend deux éléments lateraux (12, 12'; 13, 13') supportant entre eux deux chariots (14, 15) actionnés avec des mouvements alternatifs synchronisés lelong des parcours convergent respectifs, chaqun desdits chariots (14, 15) supportant un élément à bras (14', 15') lequel s'étende dans la direction de mouvement et sur la périphérie duquel est montée de manière à pouvoir glisser une première chaîne, cette première chaîne (26) étant fixe par rapport aux éléments lateraux (12, 13) et étant pourvue de deux petite plaques saillantes et adjacentes (29) aptes à recevoir entre elles le mandrin (8) d'un rouleau qui doit être chargé sur la machine d'étalement ou le mandrin qui doit être déchargé sur ledit carrousel, la disposition étant telle que lorsque le chariot (14) se trouve à proximité du carrousel lesdites plaques se trouvent sur les deux côtés de la piste et lorsque il est à proximité de la station de chargement/déchargement elles sont disposées de manière à alimenter ou recevoir un mandrin à ou de la station.

2. Appareil selon la revendication précédente, caractérisé en ce que ledit carrousel (1) est formé par deux éléments support, un en correspondance de sa partie supérieure et un en correspondance de sa partie de fond sur chaqun desquels on a prévu des ensembles de roues dentées tournantes (2) actionnés par un motoréducteur (3) à travers d'un arbre de transmission (4) et des premiers couples d'engrenages (5), lesdites ensembles de roues dentées (2) étant engagés avec des respectifs éléments à chaîne (6) du carrousel supportant, avec des distances égales, des éléments de support (7) suspendus librement pour supporter lesdits mandrins (8) des rouleaux.

3. Appareil selon les revendications précédentés, caractérisé en ce que sur les éléments lateraux du dispositif de chargement (10) on a prévu deux couples de guides (12, 12'; 13, 13'), lesdites guides étant inclinées d'une manière différente par rapport à la direction verticale et convergeant vers le bord desdites éléments lateraux opposé audit carrousel (1) et lelong lequel sont déplacés les chariots respectifs (14, 15) actionnés par des deuxièmes éléments à chaîne (16, 17) actionnés au moyen de deuxièmes couples de roues dentées (18, 18'; 19, 19').

4. Appareil selon les revendications précédentés, caractérisé en ce que lesdits deuxièmes couples de roues dentées (18, 18'; 19, 19') sont actionnés, à travers des éléments à chaîne respectifs (20, 21) par des couples de pignons (22, 23) reliés au moyen d'arbres de transmission, par d'autres éléments à chaîne (24) et des deuxièmes ensembles de motoreducteurs (25).

5. Appareil selon les revendications précédentes, caractérisé en ce que ladite premiére chaîne est fixée en correspondance d'un point intérmediaire (27) de ladite chaîne à un élément à étrier (28) solidaire d'une desdites guides (12, 13).

6. Appareil selon les revendications précédentés, caractérisé en ce que il comprend des moyens de programmation aptes à prefixer la sequence de mouvement desdits rouleaux sur ledit carrousel (1) de manière à provoquer le déplacement desdits rouleaux vers la position de fin de la course d'un desdits chariots (14, 15) et aptes à provoquer le déplacement dudit carrousel (1) aprés le chargement du tissu sur ledit chariot (14), de manière à porter l'élément de support suspendu librement (7) du rouleau qui vient étalé sur ladite machine d'étalement à proximité de la fin de la course de l'autre dit chariot (15).

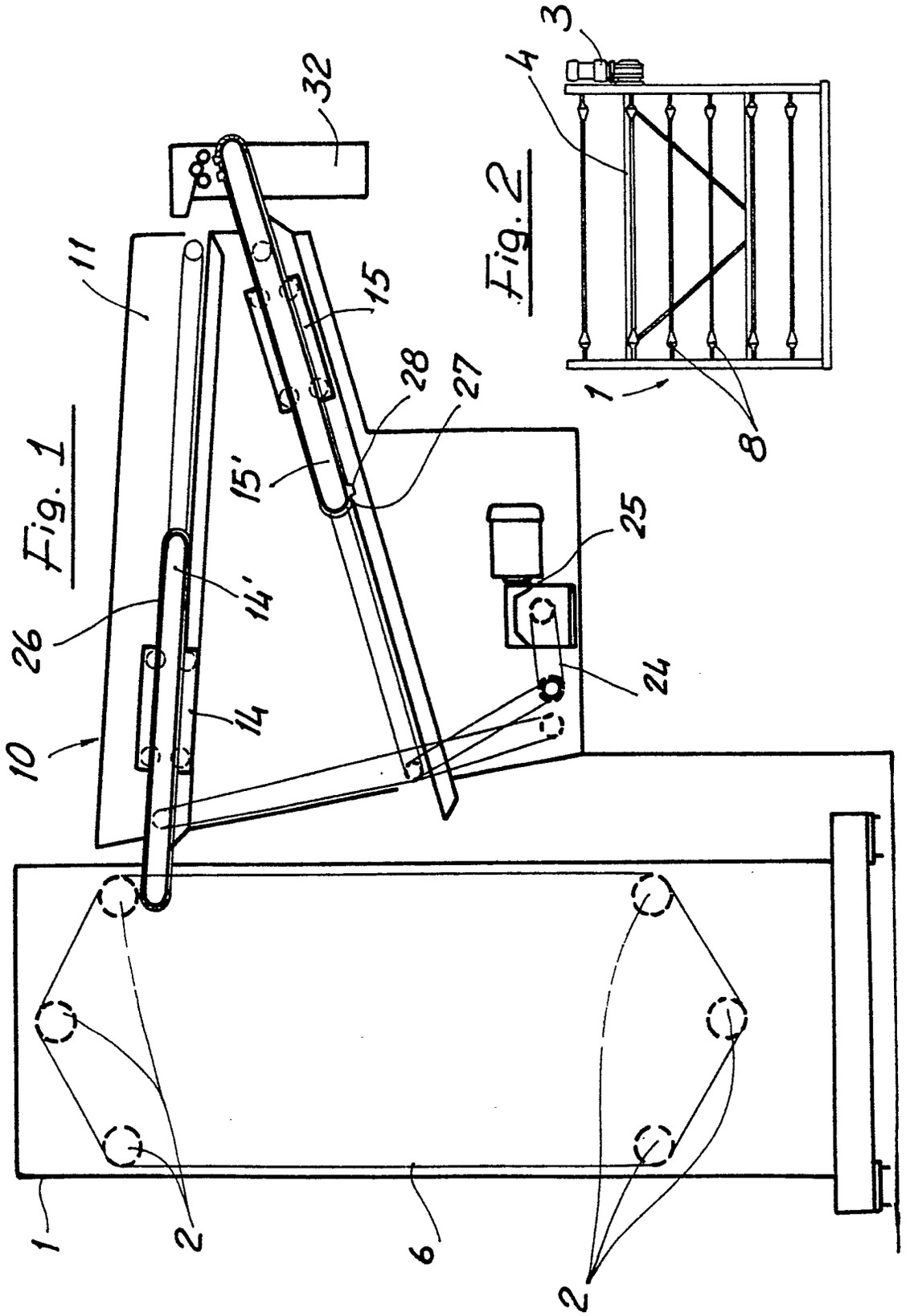


Fig. 1

Fig. 2

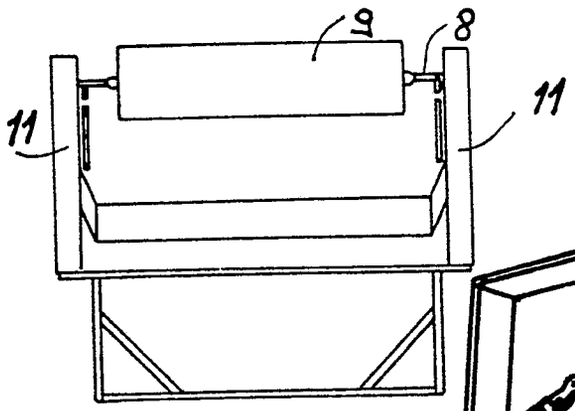


Fig. 3

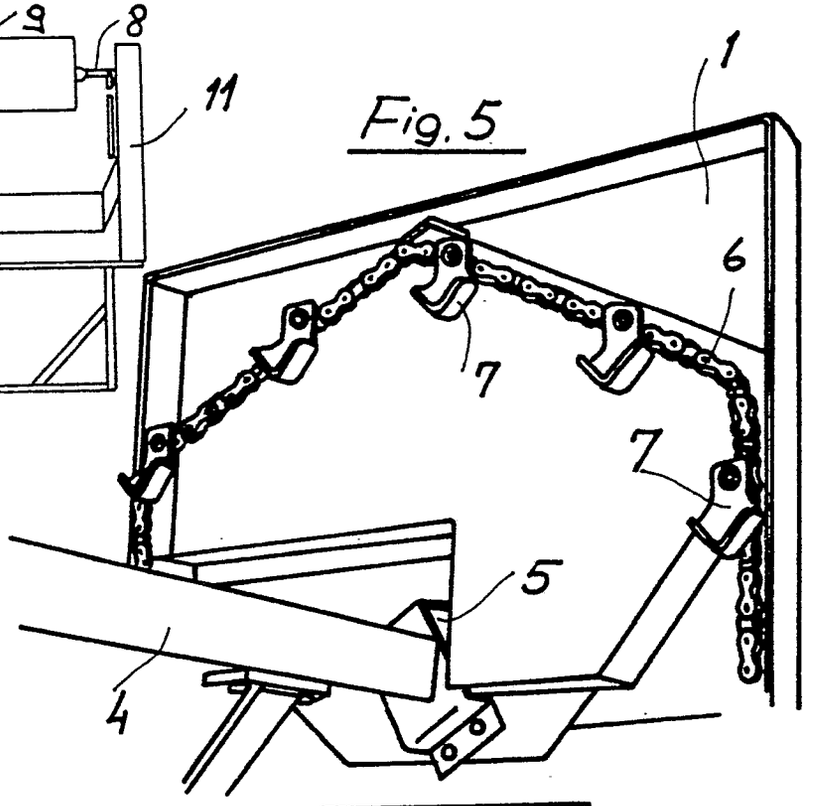


Fig. 5

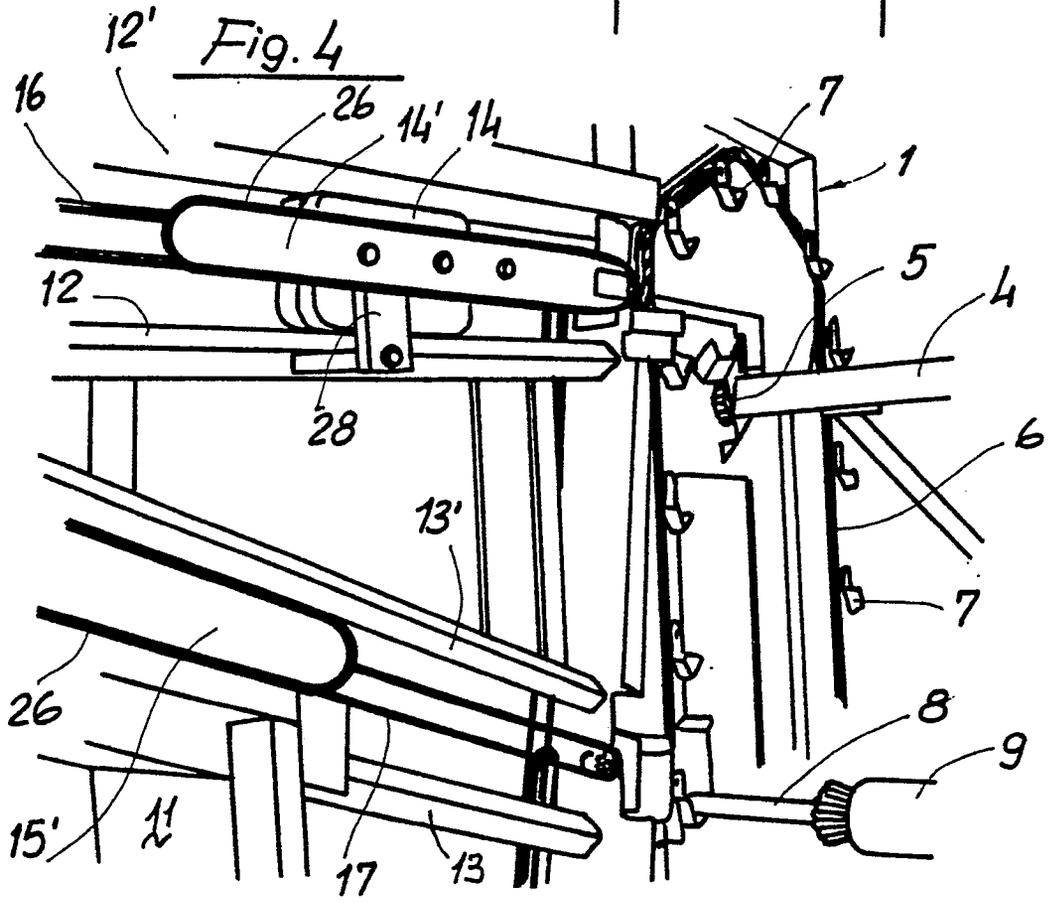
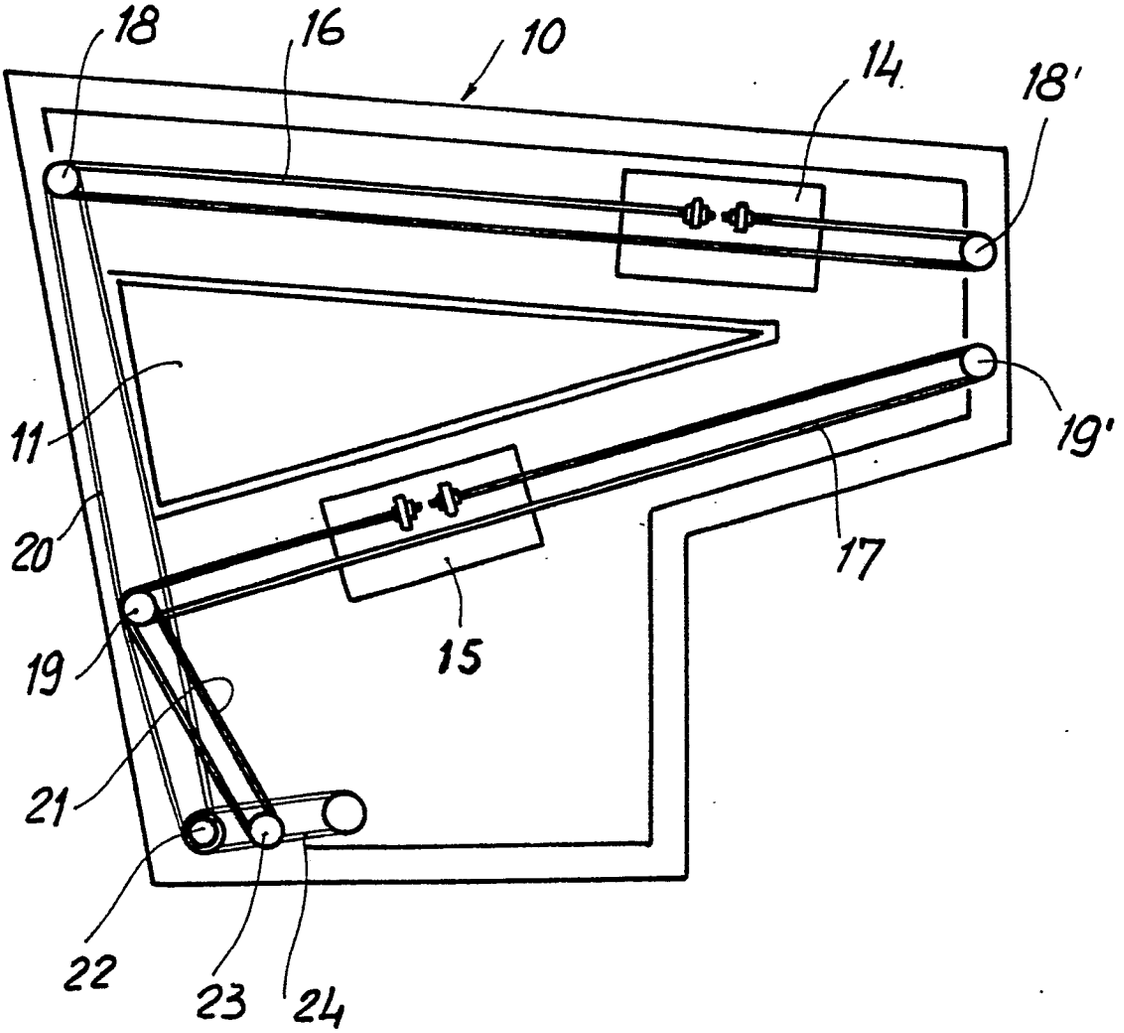


Fig. 4

Fig. 6



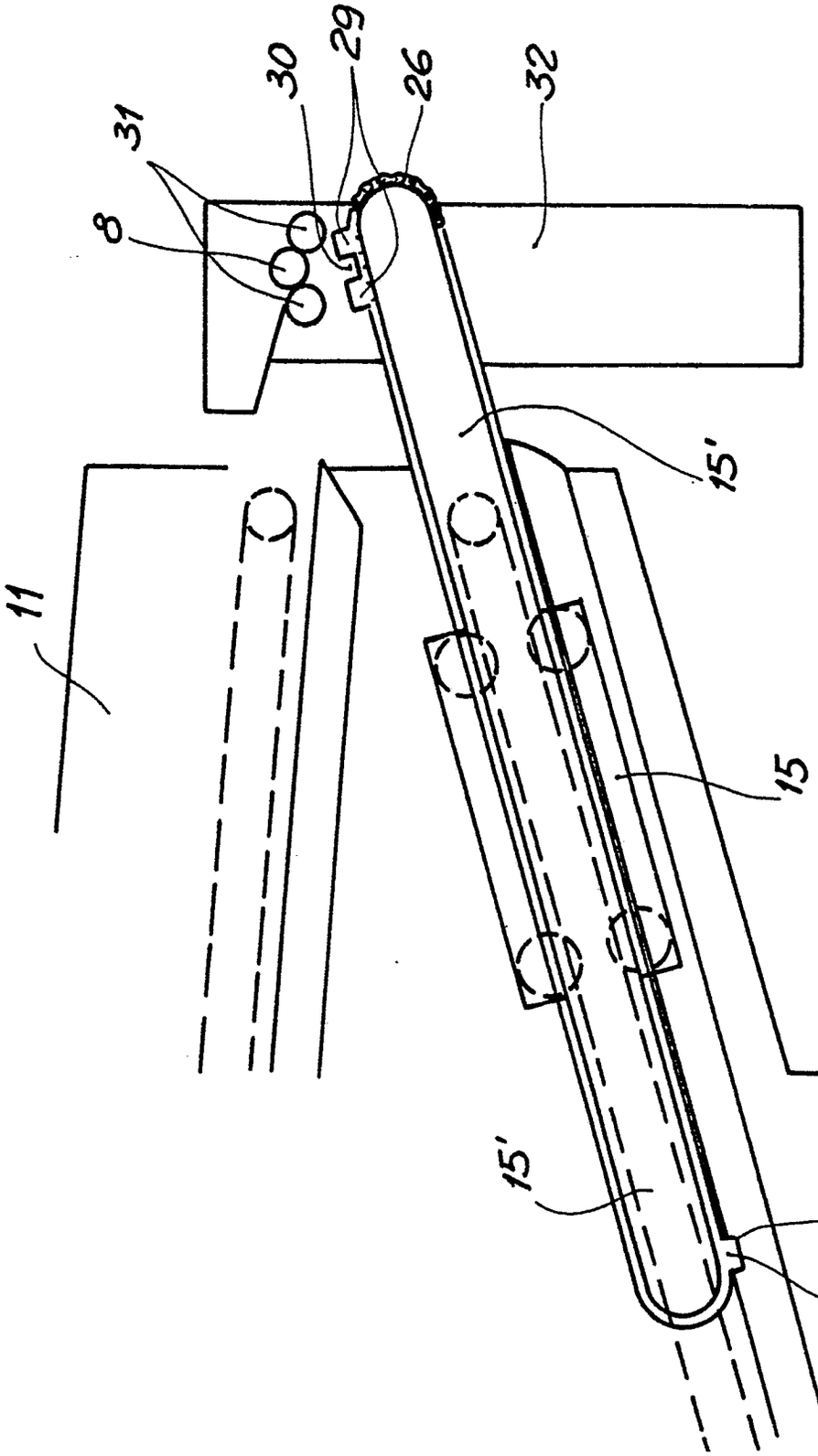


Fig. 7