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(54) **APPARATUS FOR COLLECTING, DISTRIBUTING AND STORING FLEXIBLE LAMINAR ELEMENTS, IN PARTICULAR INDUSTRIAL HIDES**

APPARAT ZUM SAMMELN, VERTEILEN UND AUFBEWAHREN VON FLEXIBLEN LAMINARELEMENTEN, INSBESONDERE VON INDUSTRIEHÄUTEN

APPAREIL PERMETTANT DE RASSEMBLER, DE REPARTIR ET DE STOCKER DES PIECES SOUPLES LAMINEES, DES CUIRS INDUSTRIELS NOTAMMENT

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Description

Technical field

[0001] The invention present relates to an apparatus for the collection, distribution and storage of flexible laminar elements, in particular of industrial hides, for inserting them in the various production phases of the tanning process.

Background art

[0002] Devices for the stacking of hides of the type above indicated are known, which are adapted to receive and stack the hides on benches or on trestles at the completion of production phases.

[0003] These machines operate substantially in the same manner as manual operators, who seize the hides after the various production stages and deposit them on benches or trestles.

[0004] Such devices however cannot be used for all products of the tanning manufacture.

[0005] They are still inaccurate in laying down the hides, cause thick folds or streakings, or slipping of the hides to the ground. All these inconveniences are unacceptable when the cost of the product is high, as in the case of valuable hides employed in the shoe or leather good sector.

[0006] A device of this type for stacking hides on special trestles is described in the International patent application No W098/43906, which includes a conveyor belt surface for conveying hides and slidably supported on a movable tray to gradually adapt to the height of the pile of hides.

[0007] A drawback of this type of device is that it is not possible to insert the hides automatically in the operating machines of the different phases of the production.

[0008] It is in fact necessary, at every passage from one production phase to the following one, to spread the hides manually, for example on the conveyor belt in proximity of the inlet portion of a spraying machine or to the clutching zone of the rotative cylinders of polishing, printing or stretching machines.

[0009] WO-A-91/04214 disclosed an apparatus for processing sheets that encompasses all the features contained in the preamble of claim 1, namely a handling unit mounted on a support unit and including two rollers rotating about substantially parallel axes, a flexible conveyor belt with opposite end portions each attached to a respective roller, a rod-shaped actuating element substantially parallel to the axes of the rollers and located in an intermediate position with respect thereto to act on said conveyor belt and maintain part thereof in unfolded condition. However, the position of the rod-shaped element is substantially fixed and cannot automatic adapt the unfolded part of the conveyor belt to the working machine to which it is coupled.

[0010] GB-A-2 107 681 discloses an apparatus for the storage of flat products in an imbricated formation in which a guide rolled is arranged between two winding shafts or cylinders to form a path for a winding band. Also in this prior art the guide roller is stationary and cannot be adapted to provide a support and working surface of variable length for the products to be stored.

Presentation of the invention

[0011] A general object of the present invention is to overcome the cited drawbacks by providing an apparatus for the collection, distribution and storage of flexible laminar elements, in particular of industrial hides, reliable and simple to operate.

[0012] A further aim of the invention is to carry out the collection, distribution and storage operations, with a high level of quality in handling the hides, reducing to the minimum the damage of the hides.

[0013] A particular aim is to reduce to the minimum operators' intervention during the operation of the apparatus by maximizing the quantity of functions carried out automatically.

[0014] In accordance with one preferred aspect of the invention, there is provided an apparatus for collecting, distributing and storing flexible laminar products, in particular industrial hides during treatment thereof by a working machine that, in accordance with claim 1, comprises a first support unit and a second hide handling unit operatively mounted on said first support unit, said second hide handling unit including two rotating cylinders with substantially parallel axes, a flexible conveyor belt with opposite end portions attached to a respective one of said cylinders and a rod-shaped actuating element substantially parallel to the axes of said cylinders and located in an intermediate position with respect thereto to act on said conveyor belt to maintain part thereof in unfolded condition, characterised in that said first support unit and said second handling unit are provided with releasable connecting means to allow their transfer either jointly or separately from each other, said rod-shaped actuating element being movable parallel to itself, there being provided substantially horizontal guide means to guide the end portions of said rod-shaped element to form a substantially horizontal support and working surface for loading, respectively unloading said flexible laminar products on or from said working machine.

[0015] Thanks to the modularity of the apparatus it is possible to collect, distribute and stock the hides in an optimal position, substantially eliminating operator intervention with reduced possibility of mistakes in the operations of insertion, distribution, collection or piling of the hides.

[0016] It is thus possible to shape a section of the conveyor belt so as to make automatic insertion of hides easier in different operating machines used in the various production phases, holding them in an optimal and

precise position with consequent qualitative increase of the finished product.

Brief description of the drawings

[0017] Further characteristics and advantages of the invention will become more apparent in light of the following detailed description of some preferred but not exclusive embodiments of an apparatus for the collection, distribution and storage of flexible laminar products illustrated with the help of the attached drawing sheets in which:

figure 1 shows an overall view of a hide spraying machine on which the apparatus according to the invention is applied;
figure 2 shows a perspective view of the first main element composing the apparatus according to the invention;
figure 3 shows a perspective view of the second main element composing the apparatus according to the invention;
figures from 4 to 7 show perspective views of the apparatus according to the invention in various sequences relative to the preparation operations;
figures 8 and 9 show perspective views of details of the apparatus according to the invention;
figures 10a, 10b, 11a - 11c show some details of the apparatus according to the invention;
figure 12 shows a detail of the actuating and tensioning devices of the apparatus according to the invention;
figures 13a -13c show side views of some sequences of the positioning of the tensioning and actuating devices of figure 12;
figures 14, 15 and 16 show various operating positions of a component part the apparatus according to the invention.

Description of a preferred embodiment

[0018] With particular reference to the figure 1, two hide distributing/collecting apparatuses 1,1', according to the invention, are placed in operating position in correspondence of a machine M, which carries out an operation of the production cycle of the hides P, for example spraying. One apparatus works as distributor of hides to be treated in the machine M while at the other extremity of the production line of the machine M, the second apparatus, identical to the first, operates as collector of treated hides. The collecting / distributing apparatus 1, illustrated in greater detail in figures 3 and 4, is made of two main parts including, the supporting unit 2 and the handling unit 3, both supported by wheels 4, 5, or by special trolleys allowing displacement in the work area manually or by automatic systems, of the type with magnetic guides.

[0019] The unit 2 is composed of a support frame 6 with connecting devices 7, 8, 9, 10 to operatively attach the handling unit 3 during the operations performed with the two units 2, 3 joined together. On one side of the frame 6 the connecting devices 7, 8 comprise driving means while those on the other side the connecting means 9, 10 have only a support function.

[0020] The connecting means of one side of the unit 2 are illustrated in detail in figure 8. They include an electric engine 11, or similar driving means, and a reduction gear 12, for transmission of the rotation to a hollow hub 13 with tapered extremity 14.

[0021] This hub contains internally a quick docking system with radially displaceable spheres 15 which can be pushed in a radial direction by a pin 16 with tapered extremity moved by an hydraulic or pneumatic piston. The device achieves the quick docking with the axis 17, by displacement in the direction of its extremity, once the pin 13 is inserted in its seating. It is thus possible to transmit the rotation motion to the axis 17 of the cylinder 18, supported by the handling unit 3.

[0022] Both the connecting devices 7, 8 are supported by guides 19, so as to axially move under the action of hydraulic or pneumatic jacks 20, or equivalent means, that allow coupling and uncoupling of the axis 17.

[0023] The second coupling device 8 is similar to the first one and performs the coupling with the axis of the second cylinder 21 of the handling unit 3.

[0024] The phases of the coupling operation of one of the coupling devices 7, 8 is illustrated in detail in figures 11a, 11b, 11c.

[0025] The handling unit 3 supports two cylinders 18, 21, each performing alternatively and reversibly a rolling up and unrolling function of a tape 22, depending on whether it operates as collector or distributor of the hides. The tape 22 is generally made of a continuous fabric that can reach a length of about 300 metres or more, but it can be made of series of tapes or wires placed side by side.

[0026] The support unit 2 includes also two guides 24, 25 provided with racks on which a carriage 25, provided with wheels 26, 27, 28 rolls. The carriage 25 can move on the guides 23, 24 by means of an electric motor 29. The carriage 25 includes also an actuating element 30 having the shape of a rod positioned horizontally and a stretching element 31 in the shape of a pendulum. The figure 12 illustrates in detail the stretching and actuating element.

[0027] As illustrated in figure 6, during the operations in which the support unit 2 and handling unit 3 operate jointly, a frame or trestle 32 is attached to them after the coupling of the two units 2, 3, thus extending the length of the guides 23, 24 so as to create a plate surface S, during unrolling of the tape sufficient to maintain the hides P stretched, which have to be collected or distributed by the same apparatus. This is illustrated in the figure 7. This trestle 32, or similar element, can also be a part of the operating machine M itself and be anchored to the apparatus 1 only at the moment of the coupling

with the machine M.

[0028] Figures 13a, 13b, 13c show in detail the various phases of the extension of the actuating element 30, which is displaced on the racks by the carriage 25 moved by the motor 29 through a reduction gear.

[0029] The actuator departs from its backward rest position and arrives at the extended position, for the subsequent distribution of the collected hides in the upper cylinder after activation of the apparatus 1.

[0030] Figure 13a shows the handling unit 3, with the loaded upper cylinder 18, already inserted in the support unit 3, with the actuating element 30 still retracted. The stretching element 31 is retracted in an upper horizontal position and is maintained in this position by an appropriate automatic control system.

[0031] In figure 13b the actuating element 30, in an intermediate position, is driven parallely to itself by the movement of the carriage 25 which is guided on the guides 23, 32. The pendulum stretching element 31 is still maintained in a raised horizontal position.

[0032] In figure 13c the actuating element has reached the foremost final position for distribution of the hides P. The stretching element 31 is released by the lifting device and moves downwards, in the working position, with an inclination optimally set so as to perform both the desired stretching action on the tape 22 and the compensating action during the rolling up of the tape on the lower cylinder 21.

[0033] The sliding of the tape 22 on the apparatus 1 can occur at variable speed, dependent on the thickness of the hides and on the density at which they are loaded in the superior cylinder. Moreover the feeding speed of the hides in the various machine on which the apparatus 1 can operate can be different.

[0034] Control is necessary as, for example, in the distribution function of the hides, the advancement speed of the tape must be maintained strictly steady and equal to the speed of the operating machine which is served.

[0035] So, in order to guarantee a regular sliding of the tape 22, in accordance with the invention, the apparatus 1 is provided with an adequate control, not shown in the figures, performing a servo-diameter function: the upper cylinder 18 reduces its diameter, during its gradual unrolling and consequently it must increase its rotation speed to guarantee that the advancing speed remains constant, while the lower cylinder increases its diameter, by rolling up the tape released by the upper cylinder, and must thus reduce its rotation speed. The servo-diameter system is provided with two distinct closed loop controls: a speed control for the upper cylinder 18 and a position control for the lower cylinder 21.

[0036] The closed loop speed control of the upper cylinder 18, that constitutes through a tension inverter and a three-phase asynchronous motor the drive of the upper cylinder, takes the speed as reference, that is the desired speed that the tape must have, from a first tachymetric device of the phonic wheel, encoder, tachymetric dynamo or similar type, placed on the operating machine to be served. This signal is compared to an analogous feed-back signal coming from a second tachymetric device placed on a roll 35, supported by the trestle 32 and driven in rotation by the tape 22 and detects the actual linear speed. The difference between the two signals, opportunely modified by a correcting network to guarantee the stability of the system, produces an error signal, which acts on the tension inverter and corrects the rotation speed of the asynchronous motor and consequently of the cylinder, in such a way to make it exactly equal to the reference speed, thus eliminating the error. The second control system acts on the lower cylinder 21 and has the function of recovering or releasing the tape, guaranteeing a steady and ideal tension. The closed loop position control, which controls the operation of the lower cylinder 21 through a tension inverter and a three-phase asynchronous motor, detects the position reference through an opportune potentiometer, placed on the electric console, producing an exact tension signal. This tension signal corresponds to a given angular position of the stretching element 31. An increase of the reference signal increases the wanted inclination of the stretching element 31 and then the wanted strain of the tape. The feed-back angular signal of the stretching element 31 is obtained by a rotative potentiometric transducer, that produces a tension signal corresponding to the angular position actually taken by the stretching element. The difference between the reference signal of and the feed-back signal produces the error signal, that corrects the rotation speed of the asynchronous motor and consequently of the lower cylinder by acting on the tension inverter, after being appropriately modified by a correcting network to guarantee steady working of the system.

[0037] In this way, for example, the cylinder speed increases or decreases if the stretching element falls or raises, to quickly recover or release the conveyor tape excess and restore the wanted angular position of the corresponding stretching element corresponding to the right tension of the tape itself. In this manner the error is eliminated and the apparatus has a regular, flowing and ready functioning.

[0038] This solution, in accordance with the invention, has the advantage that it is not necessary to detect at every moment the diameters of the two cylinder 18, 21, which is a complicated operation and giving inaccurate results for the upper cylinder, since the presence of the hides inside it makes its surface very irregular. These two controls allow the provision of a precise system, with very satisfactory response times.

[0039] In addition, the coupling means 9, 10 placed on the part of the support unit 2 opposite to that of the first coupling means 7, 8, are provided with an appropriate height regulating means, like hydraulic or mechanical lifting jacks 36, 37, which performs also the centring function of the carpet by raising or lowering theirs pistons, on whose extremity are the seatings of the cylinder

hubs 18, 21.

[0040] By actuating the lifting jacks 36, 37 it is possible to raise or lower the cylinder axis to insert or release the handling unit 3 from the support unit 2.

[0041] The apparatus 1 works as follows. It is placed in correspondence of the exit of a machine M performing one of the production phases of the hides P. The hides, going out from the conveyor belt or tape of the machine are laid down smoothly on the tape 22 of the apparatus, in the zone S, which will bring the hides to roll up in spiral around the upper cylinder 18 together with the tape 22, moving with the same speed of the conveyor belt of the machine M.

[0042] At the end of this operation, a cylinder 18 loaded with hides is obtained which are wrapped in sequential and tidy way, protected from dust or from other possible contaminations, with the possibility of being stocked in a store or of being sent to following working steps on another machine.

[0043] For this reason, it is sufficient to remove the handling unit 3 from the support unit 2 and transfer it to another support unit positioned before the working plane of another machine used for a subsequent production process step. Here the upper cylinder 18 on which the hides P are wrapped inverts its rotation direction and it is unrolled so as to free the hides from its coils for their insertion in the new operating machine. During these operations the control system regulates the tape speed which is equal to the feeding speed of the hides in the operating machine.

[0044] The fixed unit 2 allows also a quick rolling up of the whole tape 22 of the cylinder on which the hides wrapped so as, in case a hide stock doesn't complete the cylinder full loading capacity, to easily and rapidly remove the cylinder and stock it in a store, as illustrated in figure 16. The store, in fact, can be developed in height and be provided with special codified seatings to receive the cylinder 18 loaded with hides. With this hide storage system, in form of cylinders, a computer-based management and handling of the store is easier to accomplish as well as the mechanical handling of the cylinders.

[0045] The figure 14 and 15 represent two handling units in two different operative situations. The figure 14 shows the case of the lower cylinder 21 having the tape completely wound up around itself, while the upper cylinder 18 has only a few windings of the tape 22 rolled up. This is the condition of the handling unit 3 unloaded and ready to receive the hides when coupled to the support unit 2.

[0046] The figure 15 shows the opposite situation to the one just described, with the handling unit 3 with the upper cylinder 18 with the tape 22 completely rolled up, and holding in its windings the hides P collected in a preceding working phase on another operating machine, for example at the exit of a drying tunnel. This second situation corresponds to the condition of a loaded handling unit 3, and ready to release the hides, for a following working phase, after coupling to the support unit 2.

[0047] The figure 16 shows schematically the possibility of placing in a vertical store the cylinders loaded with hides, for a stocking period. This system of temporary storage of the hides has the big advantage of occupying a reduced space and moreover guarantees perfect conservation conditions of the product with regard to possible environment contaminations at a limited cost.

[0048] Although the invention has been described with reference to particular means, material, and embodiments, it is to be understood that the invention is not limited to the particulars disclosed and extends to all equivalents within the scope of the claims.

Claims

1. Apparatus (1, 1') for collecting, distributing and storing flexible laminar products, in particular industrial hides (P), during treatment thereof by means of a working machine, comprising a first support unit (2) and a second hide handling unit (3) operatively mounted on said first support unit (2), said second hide handling unit (3) including two rotating cylinders (18, 21) with substantially parallel axes, a flexible conveyor belt (22) with opposite end portions attached to a respective one of said cylinders (18, 21), and a rod-shaped actuating element (30) substantially parallel to the axes of said cylinders (18, 21) and located in an intermediate position with respect thereto to act on said conveyor belt (22), **characterised in that** said first support unit (2) and said second handling unit (3) are provided with releasable connecting means (7, 8, 9, 10) to allow their transfer either jointly or separately from each other, said rod-shaped actuating element being movable parallel to itself, there being provided substantially horizontal guide means (23, 24, 33, 34) to guide the end portions of said rod-shaped element (30) to unfold said conveyor belt (22) and form therewith a substantially horizontal support and working surface (S) for loading, respectively unloading said flexible laminar products (P) on, respectively from said working machine.

2. Apparatus according to claim 1, **characterised in that** each of said cylinders (18, 21) is connected to reversible driving means (11, 11') reversibly and alternatively rolling up and unrolling said cylinders whereby said flexible conveying means (22) are alternately rolled up and unrolled.

3. Apparatus according to claim 3, **characterised in that** the axes of said cylinders (18, 21) are located in a substantially vertical or inclined plane.

4. Apparatus according to claim 3, **characterised in that** each of said units (2, 3) is mounted on wheels to allow their free displacement on the ground.

5. Apparatus according to claim 4, **characterised in that** said support unit (2) and/or said handling unit (2,3) are/is provided with automatic moving means, on magnetic tracks or similar elements, for their automatic transfer in a coupled or uncoupled condition to the following working phase or storage.

6. Apparatus according to claim 5, **characterised in that** said first support unit (2) includes rotation transmission means (12) between said driving means (11) and a respective cylinder axis (17) actuatable during reciprocal engagement of said units (2, 3) and disengageable upon separation thereof.

7. Apparatus according to claim 1, **characterised in that** means are provided for adjusting the height from the ground of said releasable connecting means (7, 8, 9, 10).

8. Apparatus according to claim 1, **characterized in that** a tensioning device (31) is provided to maintain a predetermined tension of said conveyor belt (22) in its unfolded position.

9. Apparatus according to claim 1, **characterised in that** at least one of said units (2, 3) provide sensing means associated with detecting means, data collecting means and adjusting and control means, for the automatic control of the belt advancing speed in accordance with the machine (M) to which it is coupled.

10. Apparatus according to claim 9, **characterised in that** said sensing means are optic, phonic wheel or tachymetric dynamo means.

11. Apparatus according to claim 10, **characterised in that** said regulation and control means are manual.

12. Apparatus according to claim 11, **characterised in that** said regulation and control means are electric or electronic of the impulse photocell type.

13. Machine for hide treatment, comprising the apparatus according to any one or more claims from 1 to 12, **characterized in that** said horizontal guide means (23, 24, 33, 34) are fixed to the machine itself.

Patentansprüche

1. Vorrichtung zum Sammeln, Verteilen und Lagern biegsamer, laminarer Erzeugnisse, insbesondere industrieller Häute (P), während derer Behandlung mittels einer Arbeitsmaschine mit einer ersten Trägereinheit (2) und einer zweiten Hautbehandlungseinheit (3), die operativ auf dieser ersten Trägereinheit (2) montiert ist, wobei diese zweite Hautbehandlungseinheit (3) zwei rotierende Zylinder (18, 21) enthält mit im wesentlichen parallelen Achsen, einem biegsamen Förderriemen (22) mit gegenüberliegenden Endabschnitten, die jeweils an einen der Zylinder (18, 21) angeschlossen sind und einem pleuelförmigen Betätigungselement (30), das im wesentlichen parallel ist zu den Achsen der Zylinder (18, 21) und angeordnet ist in einer Zwischenposition mit Bezug dazu, um auf den Förderriemen (22) zu wirken, **dadurch gekennzeichnet, dass** die erste Trägereinheit (2) und die zweite Behandlungseinheit (3) mit lösbaren Verbindungseinrichtungen (7, 8, 9, 10) versehen sind, um deren Förderung entweder gemeinsam oder getrennt voneinander zu ermöglichen, wobei das pleuelförmige Betätigungselement zu sich selbst parallel beweglich ist und im wesentlichen horizontale Führungseinrichtungen (23, 24, 33, 34) vorgesehen sind, um die Endabschnitte des pleuelförmigen Betätigungselements (30) so zu führen, dass der Förderriemen (22) entfaltet und damit ein im wesentlichen horizontaler Träger und Arbeitsplatte (S) geformt ist zum Laden, beziehungsweise Entladen der biegsamen, laminaren Erzeugnisse (P) auf beziehungsweise von der Arbeitsmaschine.

2. Vorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** jeder der Zylinder (18, 21) verbunden ist mit umkehrbaren Antriebseinrichtungen (11, 11'), die reversibel und alternativ diese Zylinder auf- und abrollen, wobei die biegsamen Fördereinrichtungen (22) alternativ auf- und abgerollt werden.

3. Vorrichtung gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Achsen der Zylinder (18, 21) in einer im wesentlichen vertikalen oder geneigten Ebene angeordnet sind.

4. Vorrichtung gemäß Anspruch 3, **dadurch gekennzeichnet, dass** jede der Einheiten (2, 3) auf Rädern angeordnet sind, um deren freie Verschiebbarkeit zum Boden zu ermöglichen.

5. Vorrichtung gemäß Anspruch 4, **dadurch gekennzeichnet, dass** die Trägereinheit (2) und/oder die Behandlungseinheit (2, 3) mit automatischen Bewegungseinrichtungen auf magnetischen Spuren oder ähnlichen Elementen versehen sind/ist zu deren automatischer Förderung in einem gekoppelten oder ungekoppelten Zustand zum folgenden Arbeitstakt oder zum Lagern.

6. Vorrichtung gemäß Anspruch 5, **dadurch gekenn-**

zeichnet, dass die erste Trägereinheit (2) Drehübertragungseinrichtungen (12) zwischen den Antriebseinrichtungen (11) und einer jeweiligen Zylinderachse (17) aufweist, die betätigbar ist während reziproken Eingriffs der Einheiten (2, 3) und lösbar nach deren Trennung.

7. Vorrichtung gemäß Anspruch 8, **dadurch gekennzeichnet, dass** Einrichtungen vorgesehen sind zur Einstellung der Höhe vom Boden der lösbaren Verbindungseinrichtungen (7, 8, 9, 10).

8. Vorrichtung gemäß Anspruch 9, **dadurch gekennzeichnet, dass** eine Spannvorrichtung (31) vorgesehen ist, um eine vorbestimmte Spannung des Förderriemens (22) in seiner entfalteten Stellung aufrecht zu erhalten.

9. Vorrichtung gemäß Anspruch 10, **dadurch gekennzeichnet, dass** mindestens eine der Behandlungseinheiten (2, 3) mit Spür- und verbundenen Erfassungseinrichtungen, Datenerfassungseinrichtungen und Einstellungs- und Steuereinrichtungen versehen ist für die automatische Steuerung der Vorwärtsgeschwindigkeit des Riemens in Abstimmung mit der Maschine (M), an die sie gekoppelt ist.

10. Vorrichtung gemäß Anspruch 9, **dadurch gekennzeichnet, dass** die Spüreinrichtungen als optische, phonische Radoder tachymetrische Dynamoeinrichtungen ausgebildet sind.

11. Vorrichtung gemäß Anspruch 10, **dadurch gekennzeichnet, dass** die Einstellungs- und Steuereinrichtungen als manuelle Einrichtungen ausgebildet sind.

12. Vorrichtung gemäß Anspruch 11, **dadurch gekennzeichnet, dass** die Einstellungs- und Steuereinrichtungen als elektrische oder elektronische des Impuls-Photozellen-Typus ausgebildet sind.

13. Maschine zur Behandlung von Häuten mit der Vorrichtung gemäß einem der oder mehrerer Ansprüche von 1 bis 12, **dadurch gekennzeichnet, dass** die horizontalen Führungseinrichtungen (23, 24, 33, 34) an der Maschine selbst befestigt sind.

Revendications

1. Dispositif (1, 1') destiné à collecter, distribuer et stocker des produits laminaires flexibles, en particulier des peaux industrielles (P) pendant leur traitement, exécuté au moyen d'une machine de travail comprenant une première unité de support (2) et une deuxième unité de manipulation des peaux (3), qui est montée fonctionnellement sur ladite première unité de support (2), ladite deuxième unité de manipulation des peaux (3) comprenant deux cylindres rotatifs (18, 21) à axes sensiblement parallèles, une courroie transporteuse flexible (22) dont des portions d'extrémité opposées sont fixées chacune à l'un des cylindres (18, 21) qui lui correspond respectivement, et un élément d'actionnement (30) en forme de barre, sensiblement parallèle aux axes desdits cylindres (18, 21) et placé dans une position intermédiaire par rapport à ceux-ci pour agir sur ladite courroie transporteuse (22), **caractérisé en ce que** ladite première unité de support (2) et ladite deuxième unité de manipulation (3) sont équipées de moyen de liaison séparables (7, 8, 9, 10) pour permettre de les transférer, soit ensemble, soit séparément l'un de l'autre, ledit moyen d'actionnement en forme de barre pouvant se déplacer parallèlement à lui-même, cependant qu'il est prévu des moyens de guidage sensiblement horizontaux (23, 24, 33, 34) pour guider les portions d'extrémité dudit élément (30) en forme de barre pour déployer ladite courroie transporteuse (22) et former avec celle-ci une surface de support et de travail (S) sensiblement horizontale pour charger lesdits produits laminaires flexibles (P) sur ladite machine de travail et les en décharger respectivement.

2. Dispositif selon la revendication 1, **caractérisé en ce que** chacun desdits cylindres (18, 21) est relié à des moyens d'entraînement réversibles (11, 11') qui enroulent ou déroulent lesdits cylindres de façon réversible et alternative, avec pour effet que lesdits moyens de transport flexibles (22) sont alternativement enroulés et déroulés.

3. Dispositif selon la revendication 3, **caractérisé en ce que** les axes desdits cylindres (18, 21) sont placés dans un plan sensiblement vertical ou incliné.

4. Dispositif selon la revendication 3, **caractérisé en ce que** chacune desdites unités (2, 3) est montée sur roues pour lui permettre se déplacer librement sur le sol.

5. Dispositif selon la revendication 4, **caractérisé en ce que** ladite unité de support (2) et/ou ladite unité de manipulation (2, 3) est ou sont équipée(s) de moyens mobiles automatiques, sur rails magnétiques ou éléments similaires, prévus pour leur transfert automatique dans un état accouplé ou désaccouplé à la phase de travail suivante ou au stockage.

6. Dispositif selon la revendication 5, **caractérisé en ce que** ladite première unité de support (2) comprend des moyens de transmission de la rotation (12) entre lesdits moyens d'entraînement (11) et un

axe de cylindre respectif (17), qui peuvent être actionnés pendant la mise en prise réciproque desdites unités (2, 3) et qui peuvent être mis hors de prise en réponse à leur séparation.

7. Dispositif selon la revendication 8, **caractérisé en ce que** des moyens sont prévus pour régler la hauteur desdits moyens de liaison séparables (7, 8, 9, 10) au-dessus du sol.

8. Dispositif selon la revendication 9, **caractérisé en ce qu'**un moyen de tension (31) est prévu pour maintenir une tension prédéterminée de ladite courroie transporteuse (22) dans sa position déployée.

9. Dispositif selon la revendication 10, **caractérisé en ce qu'**au moins une desdites unités (2, 3) prévoit des moyens capteurs associés à des moyens détecteurs, des moyens collecteurs de données et des moyens de réglage et de commande, pour la commande automatique de la vitesse d'avance de la courroie en accord avec la machine (M) à laquelle elle est accouplée.

10. Dispositif selon la revendication 9, **caractérisé en ce que** lesdits moyens capteurs sont des moyens optiques ou à roue phonique ou à dynamo tachymétrique.

11. Dispositif selon la revendication 10, **caractérisé en ce que** lesdits moyens de réglage et de commande sont manuels.

12. Dispositif selon la revendication 11, **caractérisé en ce que** lesdits moyens de réglage et de commande sont électriques ou électroniques, du type des cellules photoélectriques à impulsions.

13. Machine pour le traitement des peaux comprenant le dispositif selon une quelconque ou plusieurs des revendications 1 à 12, **caractérisé en ce que** lesdits moyens de guidage horizontaux (23, 24, 33, 34) sont fixés à la machine elle-même.

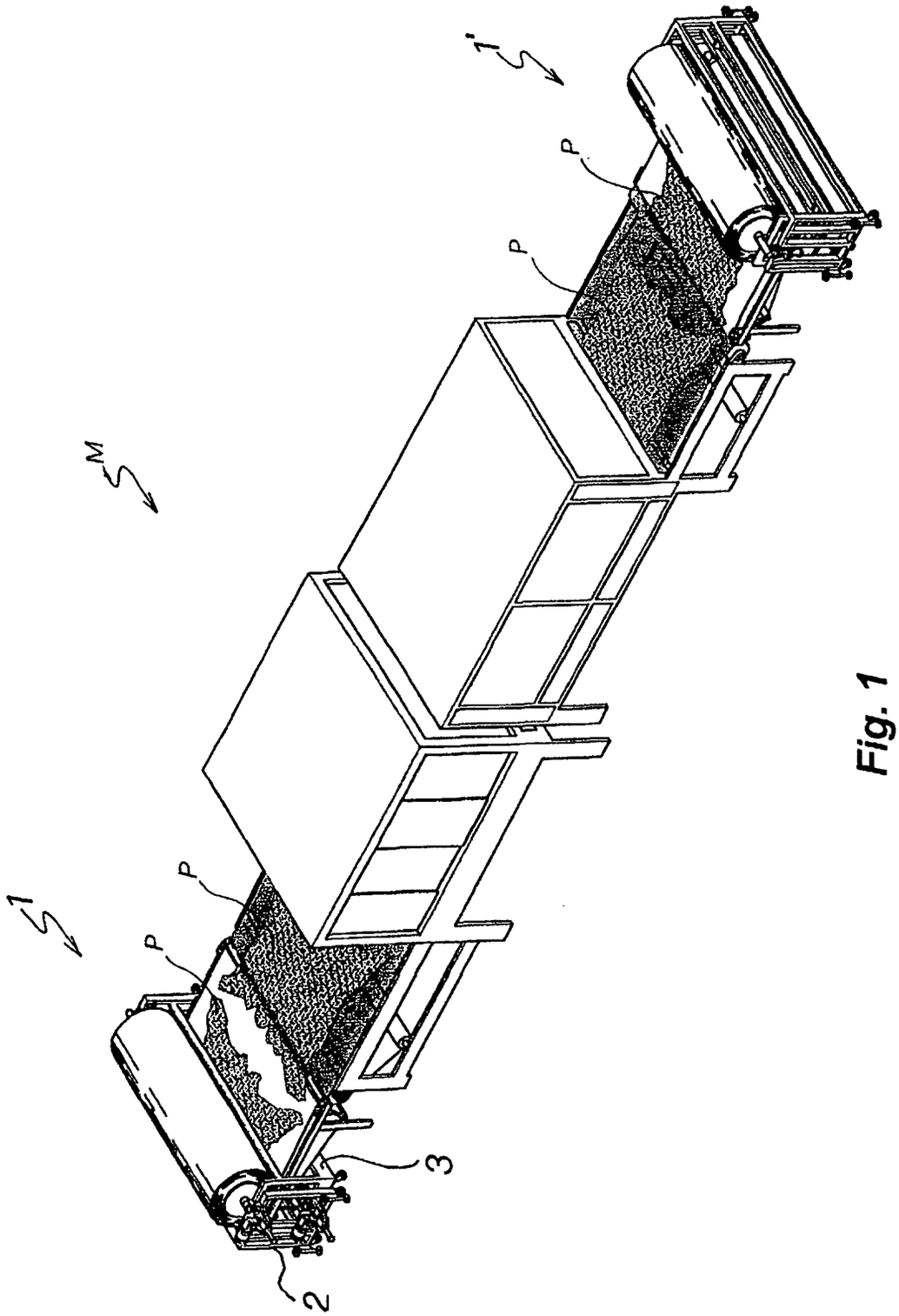


Fig. 1

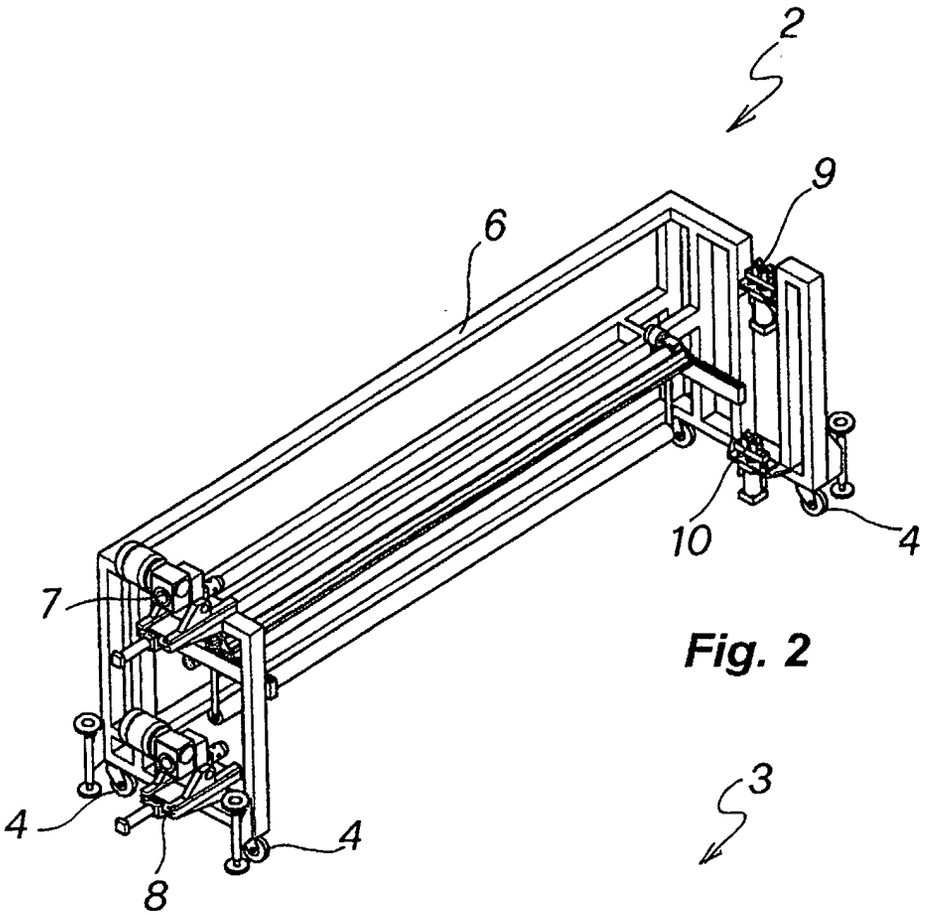


Fig. 2

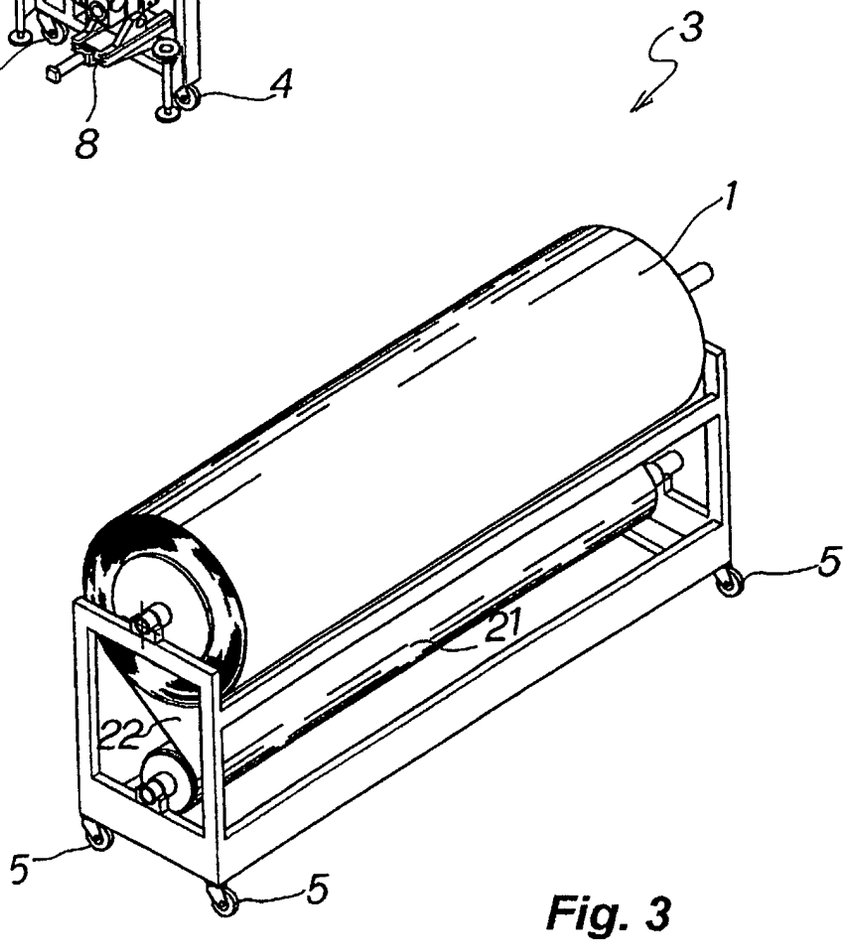


Fig. 3

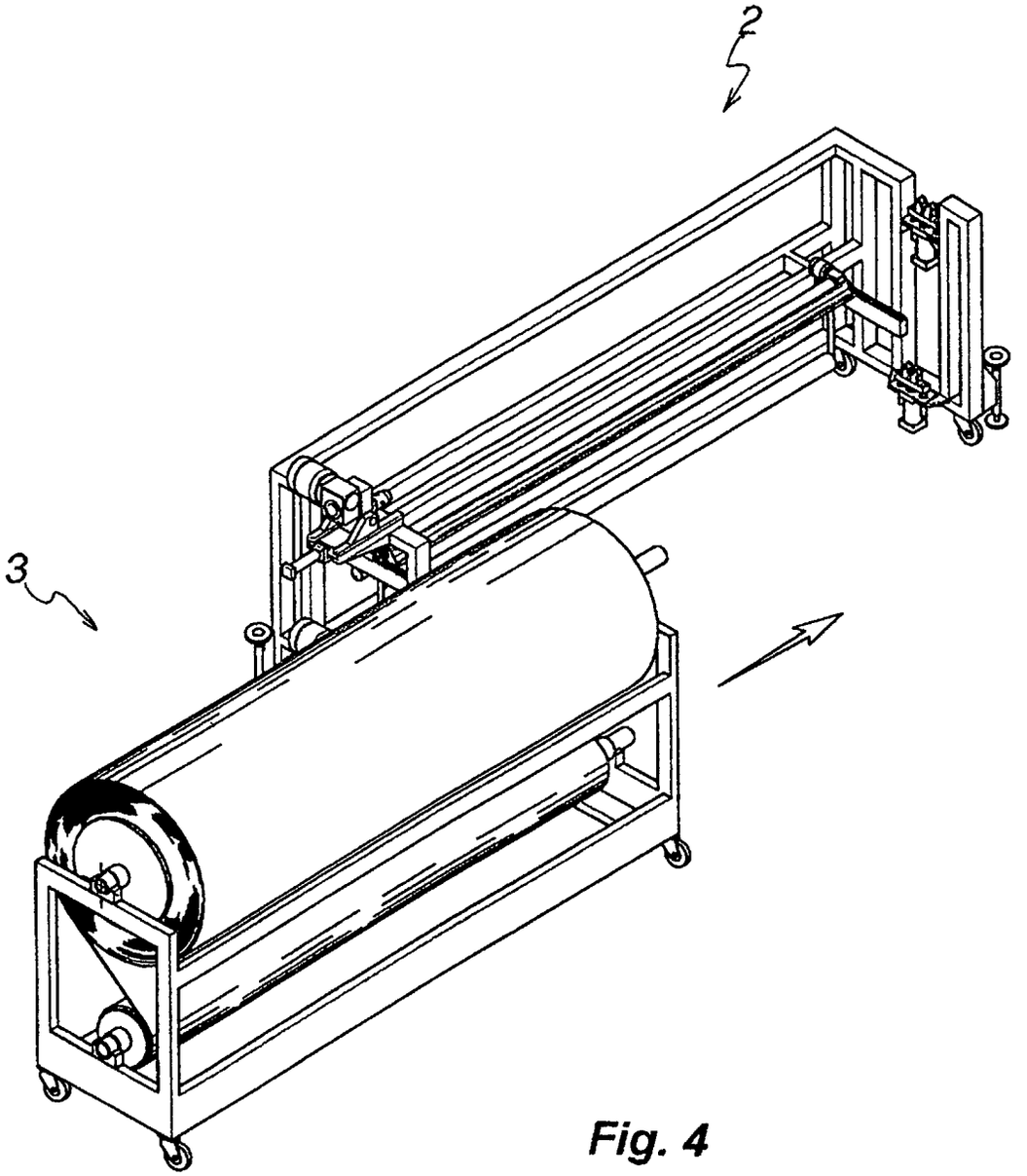


Fig. 4

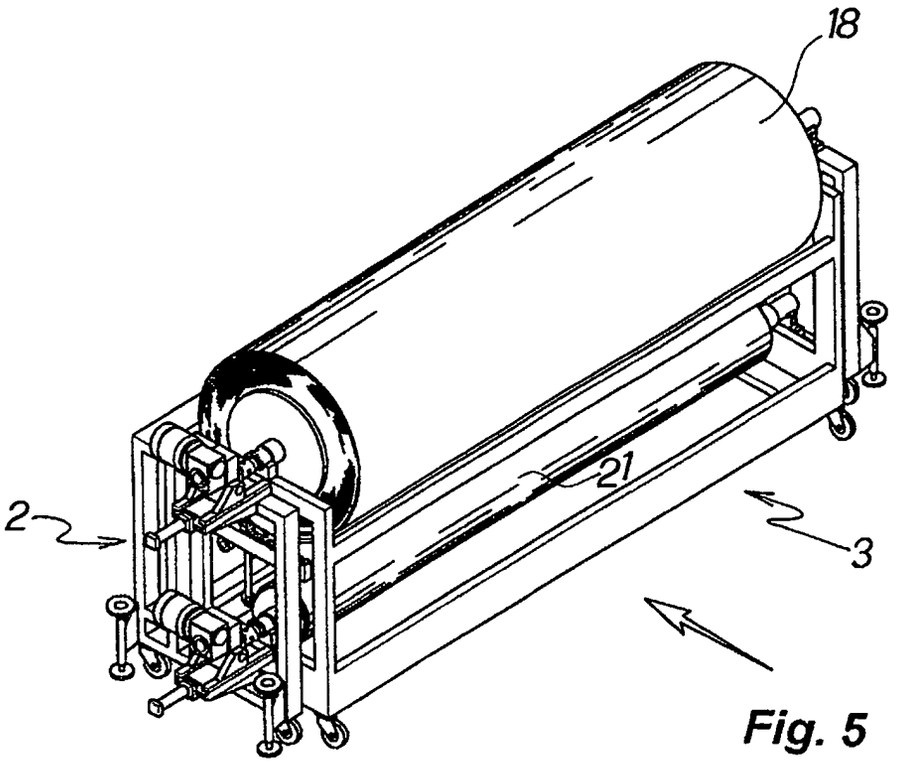


Fig. 5

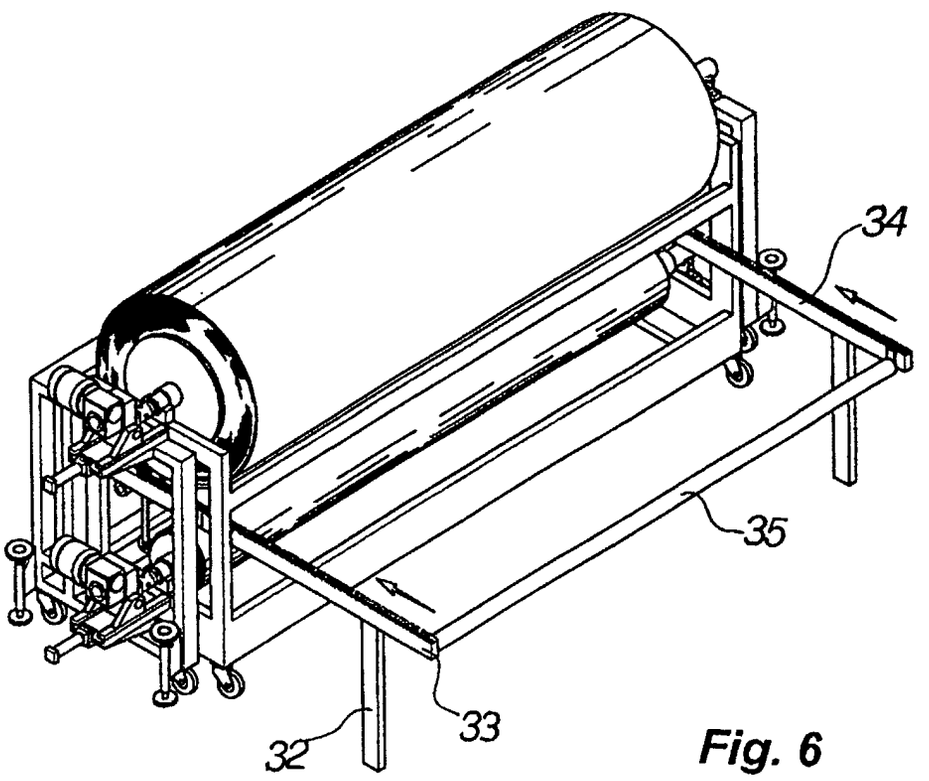


Fig. 6

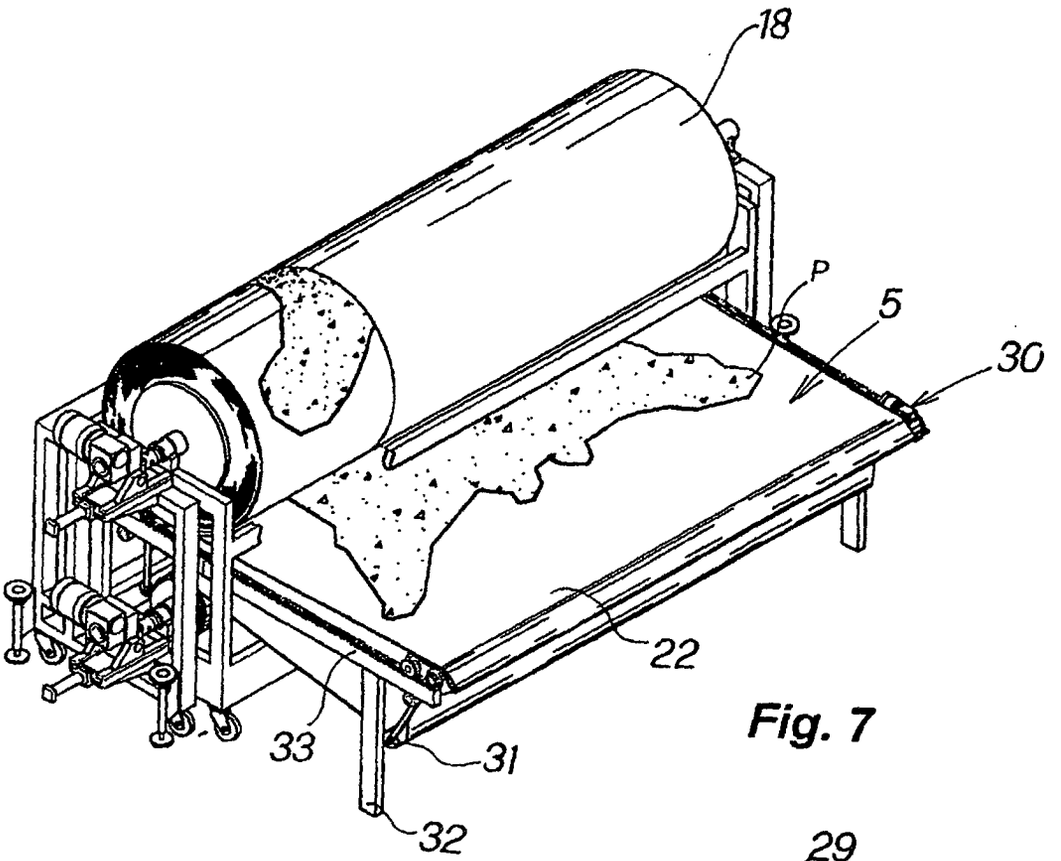


Fig. 7

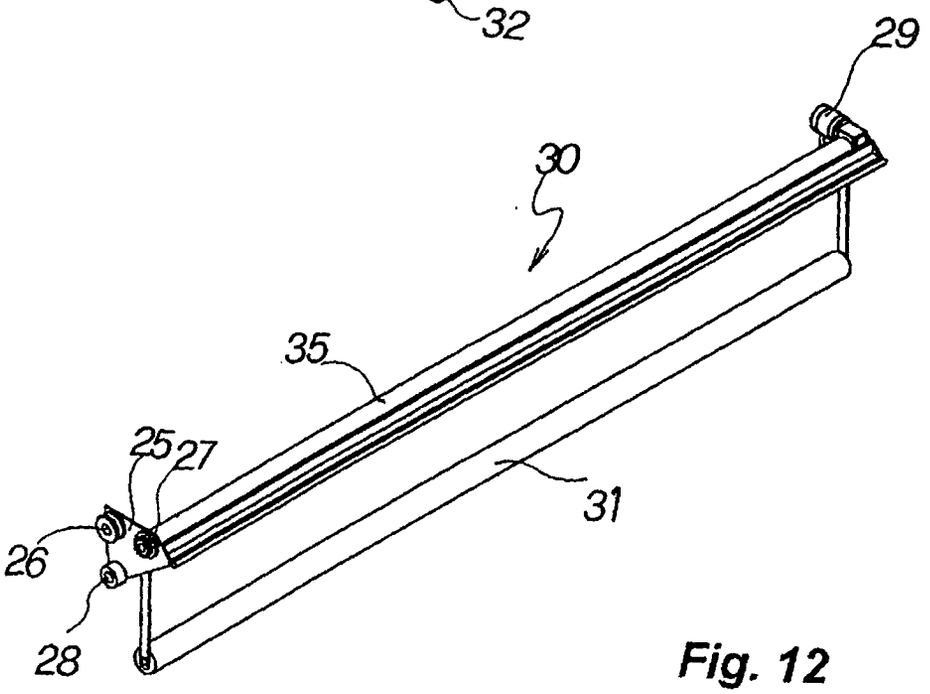


Fig. 12

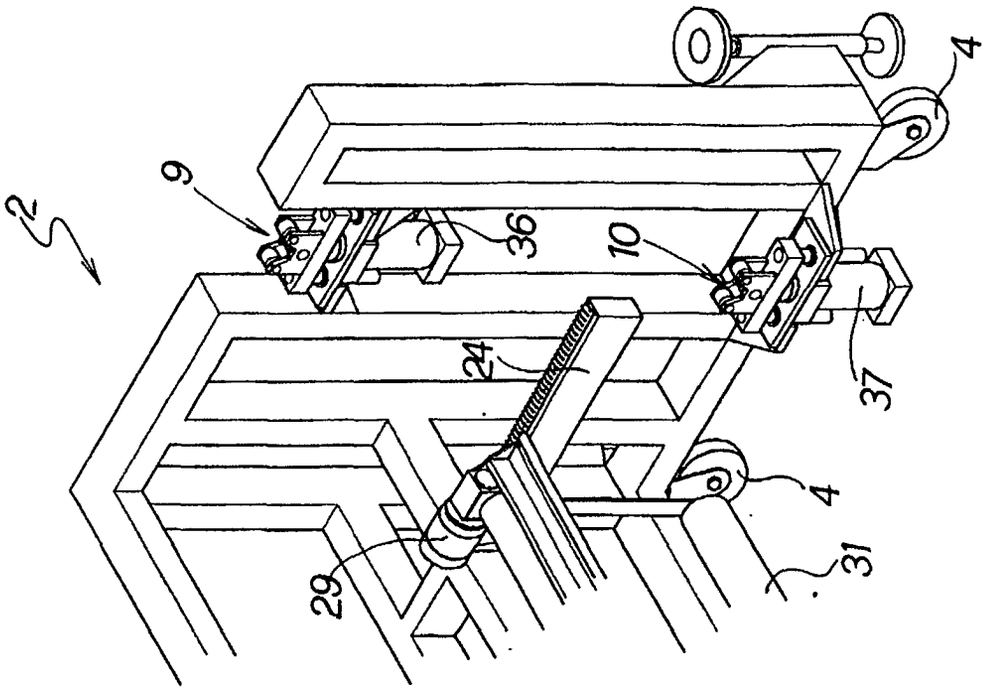


Fig. 9

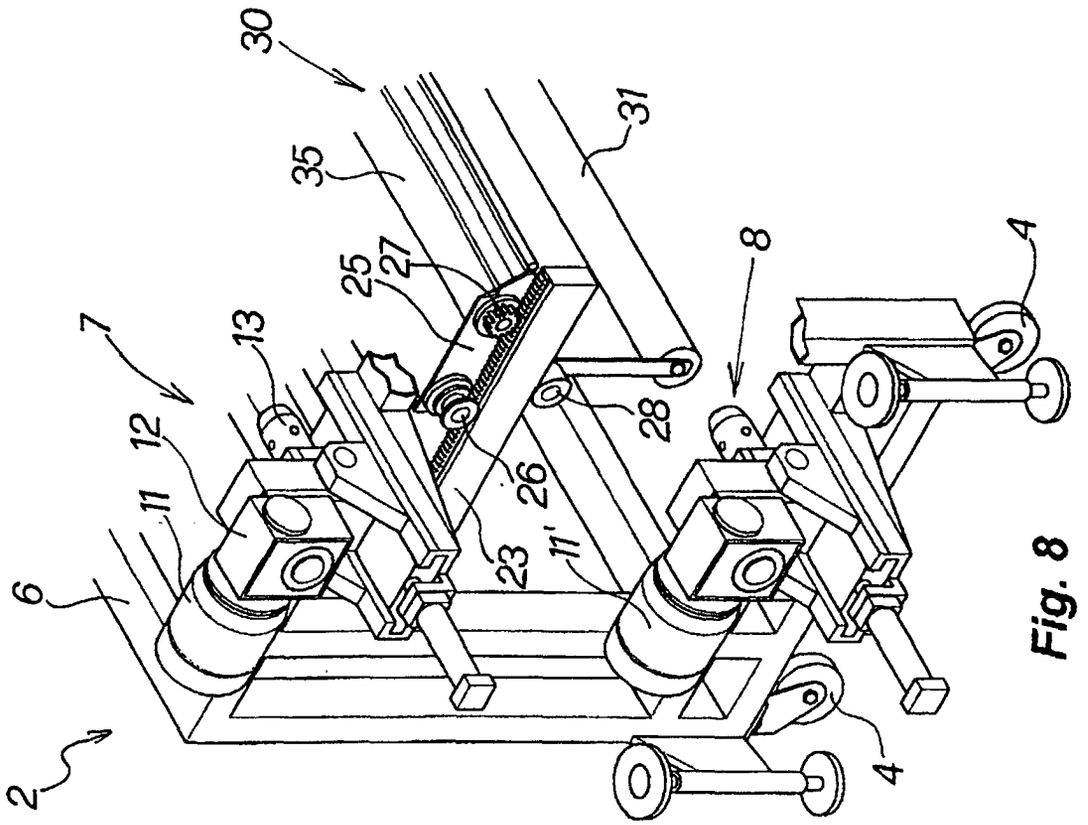


Fig. 8

Fig. 10a

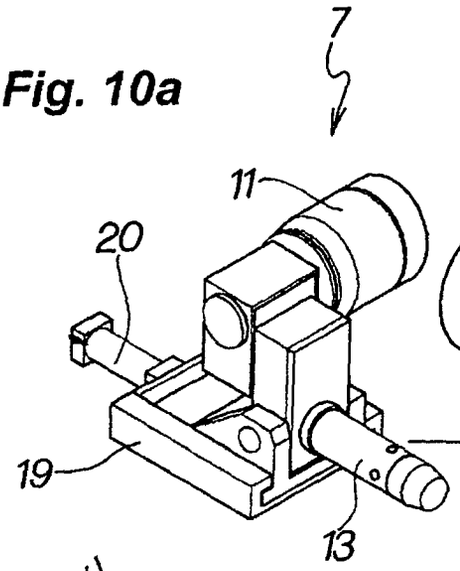
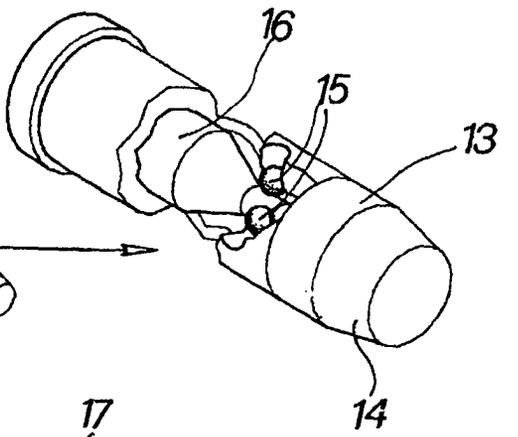


Fig. 10b



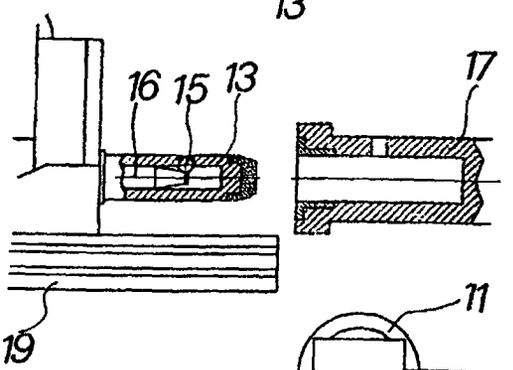


Fig. 11a

Fig. 11b

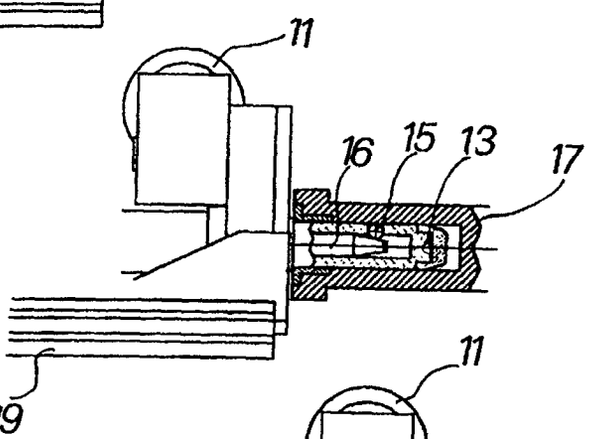
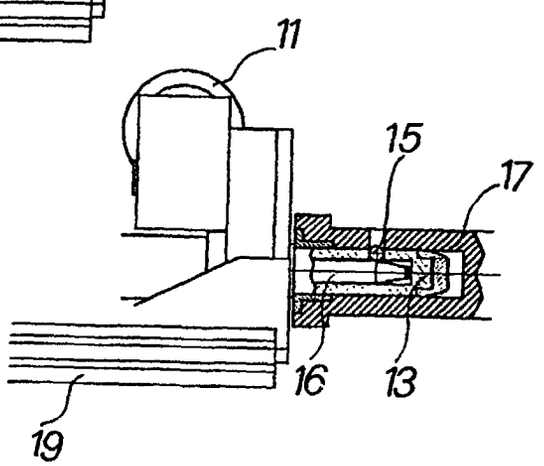


Fig. 11c



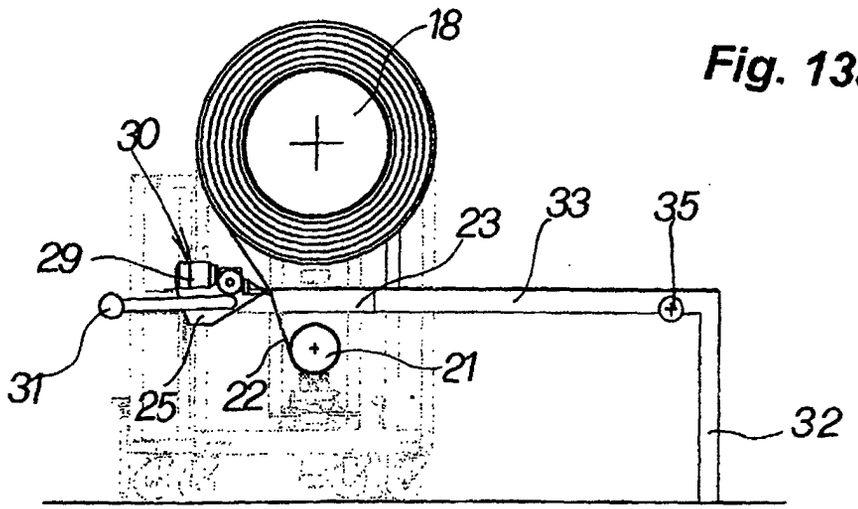


Fig. 13a

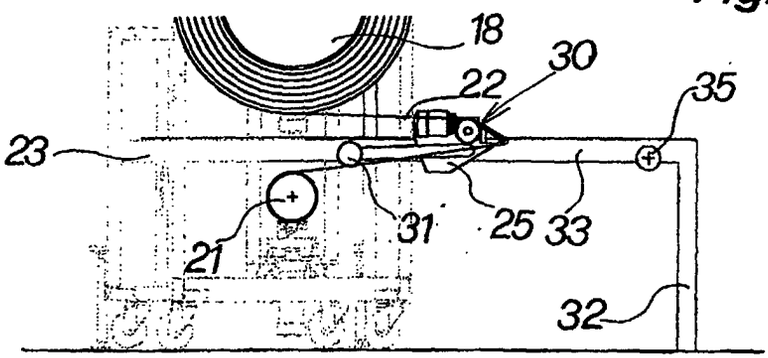


Fig. 13b

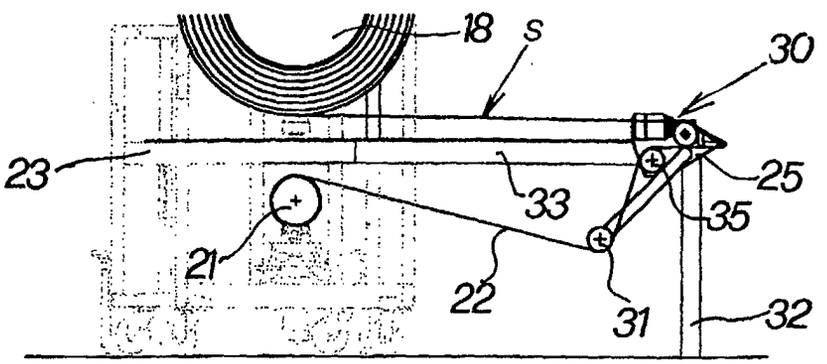
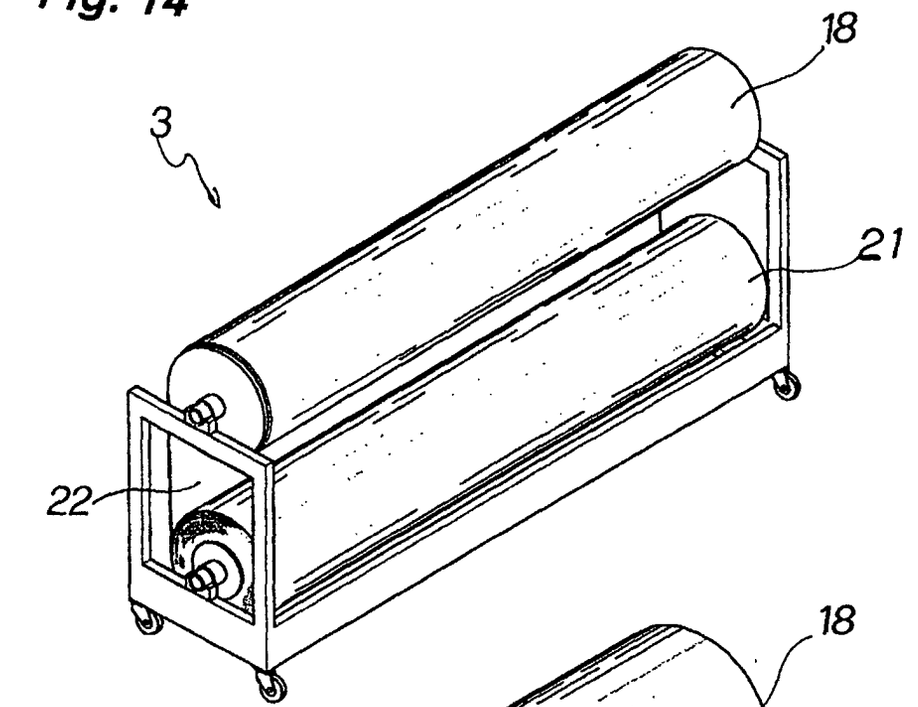


Fig. 13c

Fig. 14



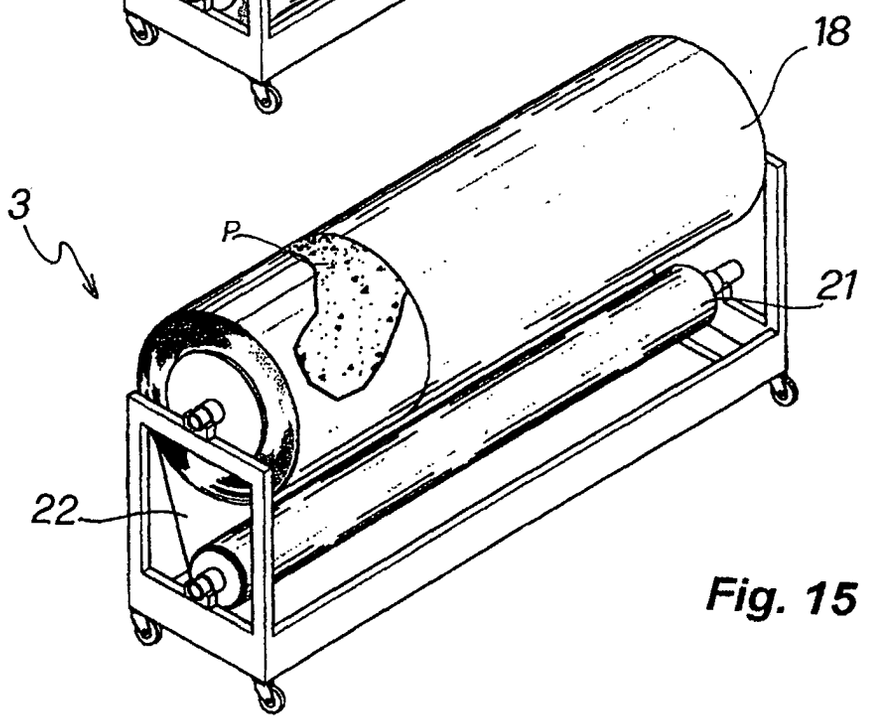


Fig. 15

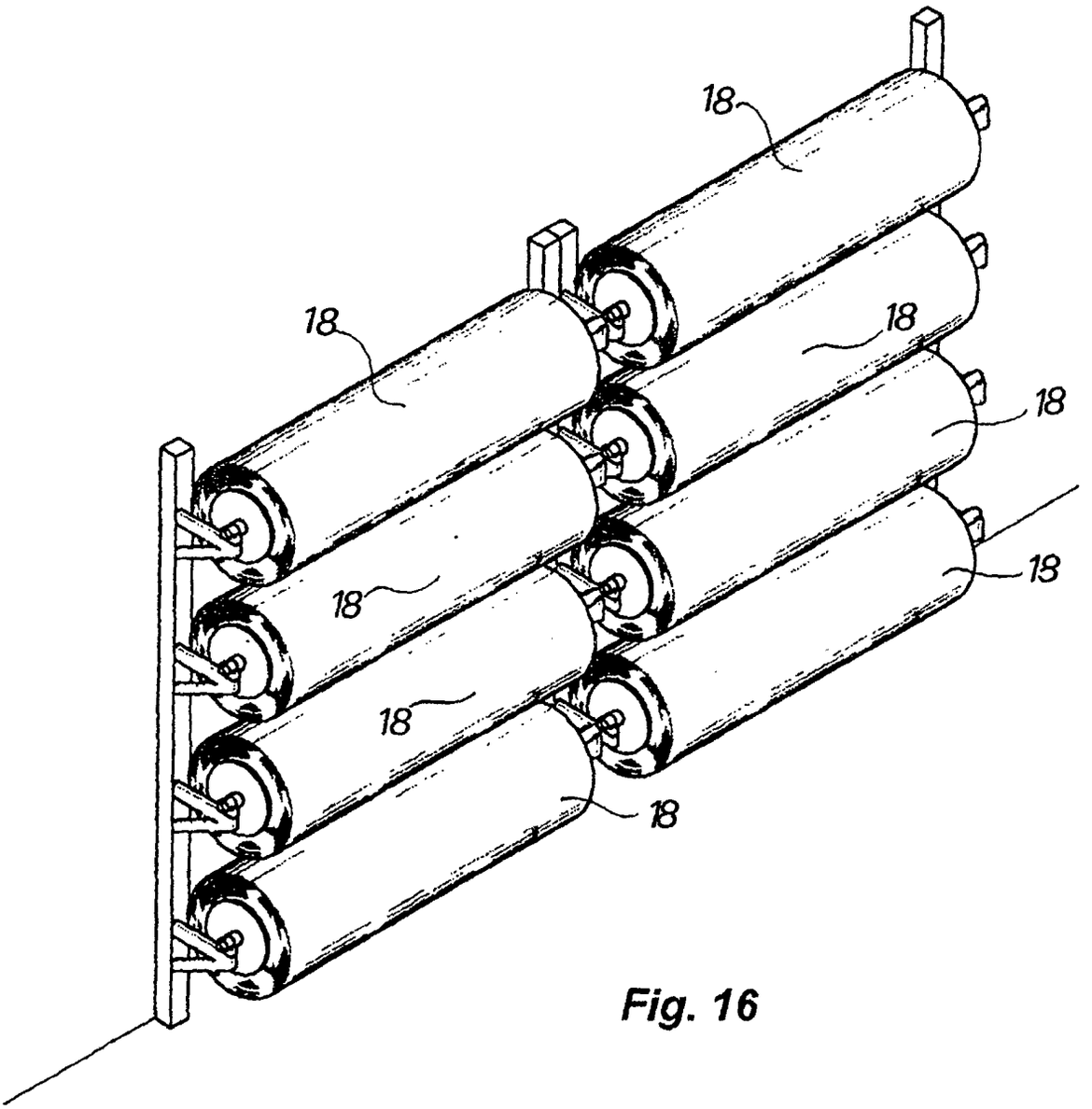


Fig. 16