

Description

[0001] The present invention relates to a machine for finishing hides, according to the general part of claim 1.

[0002] A machine for finishing hides of a known type is shown in Figure 1.

[0003] As is known, for carrying out the finishing operation in the tannery field, in particular, roller machines are used, commonly known as coating machines, in which the hides P are transported by a rubber belt 1 and pressed against an opposite engraved roller 2, which deposits onto the surface of the hide an even film of liquid L, previously spread out on said engraved roller by one or more blades 9.

[0004] The engraved roller can rotate in "synchro", that is in the same direction as the direction of advancement of the hide or in "reverse", that is in the direction opposite to the aforesaid direction of the hide.

[0005] The perfect success of the hide finishing operation depends on many factors, among which the predominant ones are a regular entry of the hide into the restricted zone, that is the one included between the engraved roller and the underlying roller or conveyor belt and a well determined compression force of the portion of hide which comes into contact, in a substantially tangent manner with the surface of the aforesaid engraved roller. The uniformity of this compression force when the roller coating machine is equipped with a conveyor rubber belt 1 depends on the tension of the belt itself to ensure the winding thereof on the first roller 4, acting as a contrast medium inside said rubber belt 1 mentioned above and opposite to the engraved roller 2.

[0006] The publication EP 0997538, which is the most important document of the state of the art, describes a machine for finishing hides which, thanks to its configuration, is able to operate also on soft hides.

[0007] The publication EP3599289 A2 describes a machine for finishing hides in which a roller supported by particular supporting elements is provided. However, also this machine does not allow to achieve the objects that will be better explained hereinafter.

[0008] Other documents of the state of the art are: KR 101151279 B1 and DE 4101003 A1.

[0009] In any case, the hides having a thin thickness tend to adhere to the conveyor belt and a device is therefore necessary which allows an easy detachment thereof for the delivery to a further transport means for the drying step.

[0010] In the present coating machines, a hide detaching roller 17 is provided, actually consisting of a cylindrical element with a modest toothing, which rotates in the same direction with respect to the second return roller and therefore with peripheral speeds of the proximal zones of these two rollers having opposite directions. Said hide detaching roller facilitates the detachment of the hide from the rubber belt and its delivery to the next transport element for the drying step.

[0011] Unfortunately, it must be considered that during

the finishing step the grain side of the hide is wetted with specific liquid products suitable for said finishing. Such liquid products obviously tend to fall both on the edge of the hides and, with the passage of time, to accumulate also on the outer surface of the conveyor belt; therefore it necessarily happens that the hide detaching roller tends to become soiled with such liquid products, both because of the contact with the edge of the already finished hides and, due to its proximity, with the conveyor belt.

[0012] In practice, given the absolute proximity between the belt and the hide detaching roller, an indirect passage of liquid chemical finishing product takes place between the belt and said hide detaching roller.

[0013] It must be considered that this is somehow acceptable in certain processes in which it is not particularly important that the meat side of the hides is somehow soiled or contaminated with liquid chemical finishing product. This is the case, for example, of hides having some type of lining or the like, at the meat side. However, there is currently a greater tendency to use hides at both their faces. In these cases, it is therefore totally unacceptable to have any type of contamination of liquid chemical finishing product, even minimal, at the meat side of the hides. Therefore, in the presence of thin and soft hides, it is not possible to use such type of finishing machines and this operation is carried out with spraying machines which are structurally different from those described above.

[0014] Another measure to facilitate the detachment of the hides from the conveyor belt consists in providing a second roller with a diameter as small as possible. In this way, the outer surface of the belt at the second roller with an extremely small diameter is necessarily destined to expand longitudinally; consequently, due to said longitudinal expansion of the belt, a sliding between the meat side of the hide and said belt is created, facilitating the detachment of said hide from the belt itself. However, this reduction in the diameter of the second roller also causes an intrinsic mechanical weakness of said roller which tends to flex excessively, since the belt must necessarily be stretched to be moved, with an unacceptable flexibility of the roller, especially at its central part.

[0015] In order to try to overcome this drawback, it has also been attempted to use rollers which are not perfectly cylindrical, but are slightly convex at their central part, so as to compensate for the longitudinal flexibility of the roller.

[0016] However, it must be considered that, obviously, the roller has a common angular speed at the whole of its development, but a peripheral speed which is greater at the zones with a greater radius. This entails the fact that, at the central zone, the roller slides on the inner part of the belt with unacceptable vibrations and wear of the belt itself.

[0017] Therefore, this measure is also rarely used.

[0018] In practice, with such constructive method, as visible in Figure 6, which relates to the invention but with elements also present in the state of the art, once the

diameter of the second roller 5 has been defined by D and the thickness of the conveyor belt has been defined by Sp, the ratio between the outer fake circumference travelled by the outer surface of the belt and the inner fake circumference travelled by the inner surface of the

$$\frac{\text{outer circumference}}{\text{inner circumference}} = 1 + \frac{2 \cdot Sp}{D}$$

belt is equal to It can be deduced therefrom that, as the diameter D decreases, there is a very considerable increase in the ratios between these two paths, with a consequent increase in the longitudinal expansion of the outer surface of the belt.

[0019] Object of the present invention is to realise a machine for finishing hides of the type described above which is capable of obviating the drawbacks manifested by similar products of known type.

[0020] Specifically, object of the invention is to realise a machine for finishing hides capable, in particular, of delivering the hides to the subsequent transport devices for the drying step without minimally soiling said hides, in particular at their meat side.

[0021] Further object of the invention is to provide a machine of this type, which is simple from the constructive point of view, practical and safer for the operator.

[0022] This is achieved, according to the invention, by providing that the second roller is equipped with at least one supporting element that is integral with the machine frame; in particular, said supporting element is positioned between the ends of said second roller to increase stiffness thereof with respect to the longitudinal flexibility.

[0023] The present invention will now be illustrated and described in detail with reference to some of its possible embodiments, given only by way of non-limiting example, with the aid of the accompanying drawings, in which;

- fig. 1 shows a schematic view of a machine for finishing hides of a known type, according to the state of the art;
- fig. 2 shows a corresponding view of the machine for finishing hides, according to the invention;
- fig. 3 shows a side view of the detail of the zone where the hide is delivered in a machine for finishing hides, both according to the state of the art and according to the invention, to the transport element for the drying step;
- figs. 4 and 5 show respectively a top plan view and a side view of the machine for finishing hides, according to the invention;
- figs. 6 and 7 show details of the machine at the second roller of the hide, according to the invention;
- figs. 8 and 9 show, respectively, an overall view and a detail of the fundamental elements of the device according to the invention, in a first particular embodiment thereof;
- figs. 10 and 11 show, respectively, an overall view and a detail of the fundamental elements of the device according to the invention, in a second particular embodiment thereof.

[0024] As shown in Figure 1, a machine for finishing hides of known type provides that a hide P is adduced by opposite belts 10, 11, which define a conveying channel 12, to a zone in which there is a rubber conveyor belt 1 as well as an engraved roller 2, which presses against the aforesaid, which deposits onto the surface of said hide P an even film of liquid L, previously spread out on said engraved roller by one or more blades 9. The belt 1 is towed by a first roller 4 and returned by a second roller 5. At said second roller 5 the hide is deposited on a subsequent conveyor means 6, in most cases consisting in fact of a suitable belt. Actually, one of the rollers 4 and 5 is a drive roller, while the other one is an idle roller and in particular the roller 4 is a drive roller and the roller 5 is an idle roller; suitable washing and drying means 3 are also provided, which operate continuously on the outer surface of the belt 1 of the machine. All this constitutes a prior art and therefore a state of the art of the present invention.

[0025] Always according to the state of the art, in order to facilitate the transfer of the hide P from the belt 1 to a conveyor means 6, a suitable hide detaching roller 17 is provided which, as already said previously, is constituted by a cylindrical element with a modest toothing which rotates in the same direction both with respect to the second roller 5 and to a roller 18 which moves the conveyor means 6 constituted, in most cases, by a suitable belt.

[0026] With reference to Figures 4 to 7, according to the invention, it can be seen that the second roller 5 is in particular provided with a supporting element 13 that is integral with the machine frame, positioned between the ends of said second roller 5 to increase stiffness thereof with respect to the longitudinal flexibility.

[0027] From the operating point of view, this supporting element is integral with a rod 14 that is parallel to the second roller 5, which is in turn hinged upon an element 15 integral with the machine fixed frame. In particular, said second roller 5 is hinged upon said element 15. In this way it is therefore evident that, thanks to the presence of the supporting element 13, the longitudinal flexibility of the roller 5 is greatly reduced, which allows to solve the problem constituted by the drawbacks manifested by similar products of known type (state of the art).

[0028] According to the invention, it is possible to ensure that the supporting frame of the second return roller 5, shown in particular in Figures 4 and 5, is in fact removable with respect to the assembly of the machine according to the invention, so as to ease assembling/disassembling operations.

[0029] As shown in particular in Figure 7, in order to allow the second roller 5 to operate with the supporting element 13, the presence of bearings 16 is provided, advantageously of the rolling type, arranged around the cylindrical core 19 of the second roller 5, so as to allow the rotation of the cylindrical core 19 with respect to the supporting element 13.

[0030] From this figure it can be seen that said cylindrical core 19 is hinged at its ends to a plate 20, integral

with the rod 14.

[0031] Figures 8 and 9 also highlight the above; in particular, it is clearly evident that it is possible to configure a single removable supporting frame with respect to the machine, so as to ease assembling/disassembling operations, as already stated above.

[0032] The machine according to the invention can comprise more return rollers, and among them it can provide an idle roller 8 (see in particular Figure 2) which has means adapted to change positioning thereof; based on said positioning, said roller 8 is in particular adapted to modify the point of contact of the rubber belt 1 with the overlying engraved roller 2.

[0033] To ensure the winding of the rubber belt 1 on the first roller 4 opposite to the engraved roller 2, in order to exert the minimum useful tension necessary to guarantee the compression force of the portion of hide which comes into contact with the aforesaid engraved roller, it is advantageous that the ratio between the diameter of the first roller 4 and the diameter of the second roller 5 is equal to or greater than 5.

[0034] From the operating point of view, the belt 1 is made of rubber, which advantageously has a hardness lower than 40 Shore A. It is also possible to provide for one or more layers of artificial or natural elements to be present on the inner surface of the rubber.

[0035] Finally, it is advantageously provided that the rubber belt 1 has a thickness S_p of the rubber portion, variable from 8 to 25 mm.

[0036] With reference to Figures 10 and 11, it can be seen that, according to a further embodiment of the device according to the invention, a plurality of supporting elements 13 is provided; as shown in these figures, they are arranged equally spaced apart between the ends of the second roller 5.

[0037] From the above description it can therefore be seen how the device according to the invention is able to meet the objects previously proposed, thanks to the fact that the at least one supporting element 13 present at the second roller 5 is able to clearly obviate the flexibility of the roller 5.

[0038] It should also be noted that the present invention may assume shapes and aspects other than those illustrated and described above, without prejudice to its essential characteristics, as defined in the following claims.

Claims

1. MACHINE FOR FINISHING HIDES, in which hides are conveyed by a rubber belt (1) and pressed against an opposite engraved roller (2), which deposits onto the surface of the hide (P) an even film of liquid (L), previously spread out on said engraved roller (2) by one or more blades (9), said belt (1) being towed by a first roller (4) and returned by a second roller (5), at which the hide is deposited on

a subsequent conveyor means (6), one of said first and second rollers (4, 5) being a drive roller and the other being an idle roller,

said machine being characterized in that the second roller (5) is provided with at least a supporting element (13) that is integral with a fixed machine frame and positioned between the two ends of said second roller (5) to increase stiffness thereof with respect to the longitudinal flexibility.

2. MACHINE, according to claim 1, **characterized in that** it is provided with washing and drying means (3) which operate continuously on the outer surface of the machine belt.
3. MACHINE, according to one or more of the preceding claims, **characterized in that** it provides a plurality of return rollers.
4. MACHINE, according to one or more of the preceding claims, **characterized in that** it provides a plurality of supporting elements (13) arranged equally spaced apart between the ends of the second roller (5).
5. MACHINE, according to one or more of the preceding claims, **characterized in that** the at least one supporting element is integral with a rod (14) that is parallel to the second roller (5), which is in turn hinged upon an element (15) integral with the machine fixed frame, said second roller (5) being hinged upon said element (15).
6. MACHINE, according to one or more of the preceding claims, **characterized in that** the first roller (4) is a drive roller, while the second roller (5) is an idle roller.
7. MACHINE, according to one or more of the preceding claims, **characterized in that** the first roller (4) is an idle roller, while the second roller (5) is a drive roller.
8. MACHINE, according to one or more of the preceding claims, **characterized in that** the ratio between the first roller (4) diameter and the second roller (5) diameter is equal to or higher than 5.
9. MACHINE, according to one or more of the preceding claims, **characterized in that** on the inner surface of the rubber belt (1) an idle roller (8) operates, which has means adapted to change positioning thereof, said roller (8), based on said positioning, being adapted to modify the contact point of the rubber belt (1) with the overlying engraved roller (2).
10. MACHINE, according to one or more of the preceding claims, **characterized in that** the return roller (5)

is assembled on a supporting frame that is removable with respect to the machine so as to ease assembling/disassembling operations.

11. MACHINE, according to one or more of the preceding claims, **characterized in that** the belt (1) is made of rubber, having hardness lower than 40 Shore A. 5
12. MACHINE, according to one or more of the preceding claims, **characterized in that** one or more layers of artificial or natural elements are present on the inner surface of the rubber. 10
13. MACHINE, according to one or more of the preceding claims, **characterized in that** the rubber belt (1) has a thickness (Sp) of the rubber portion that varies from 8 to 25 mm. 15

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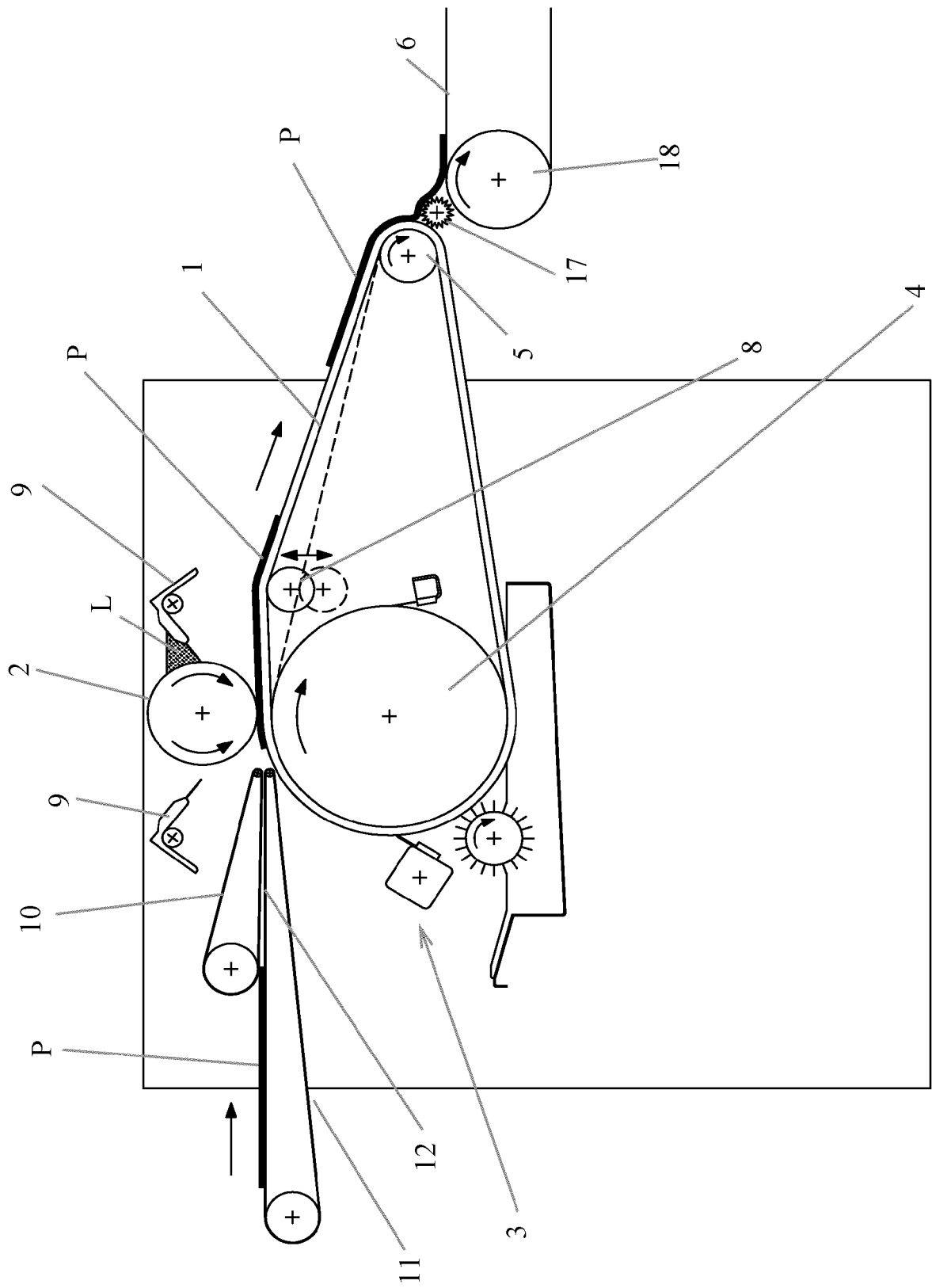


Fig. 1

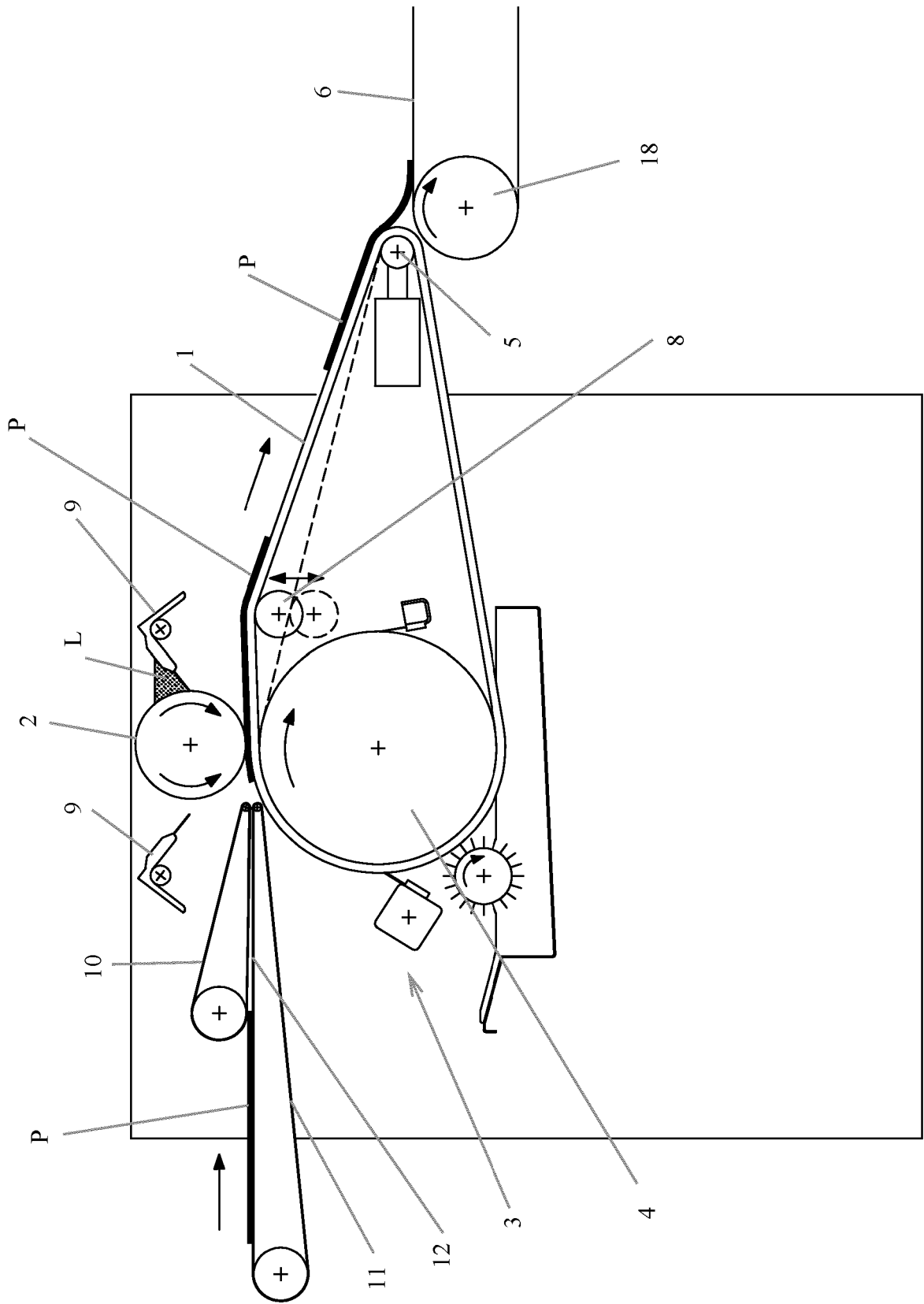


Fig. 2

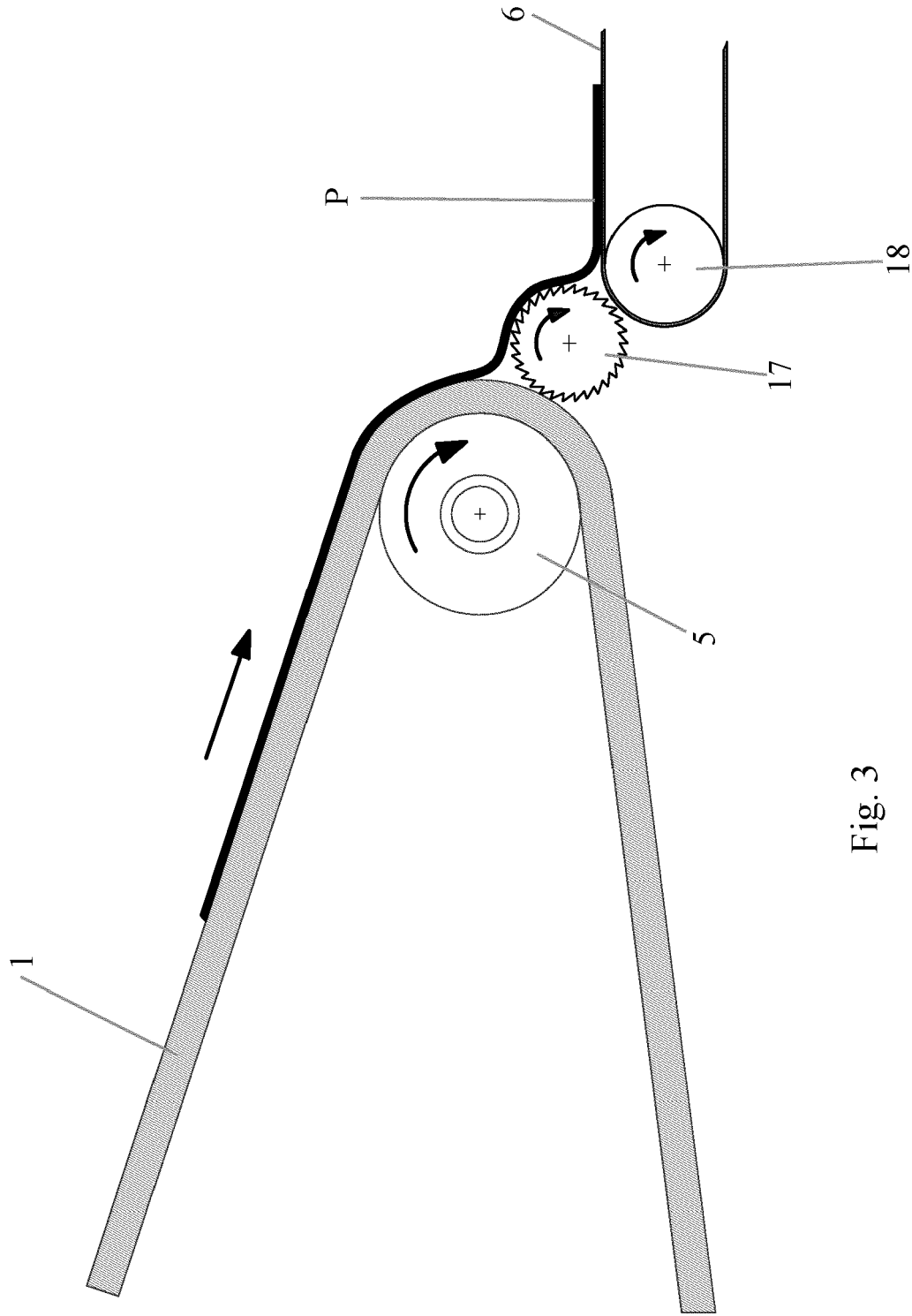
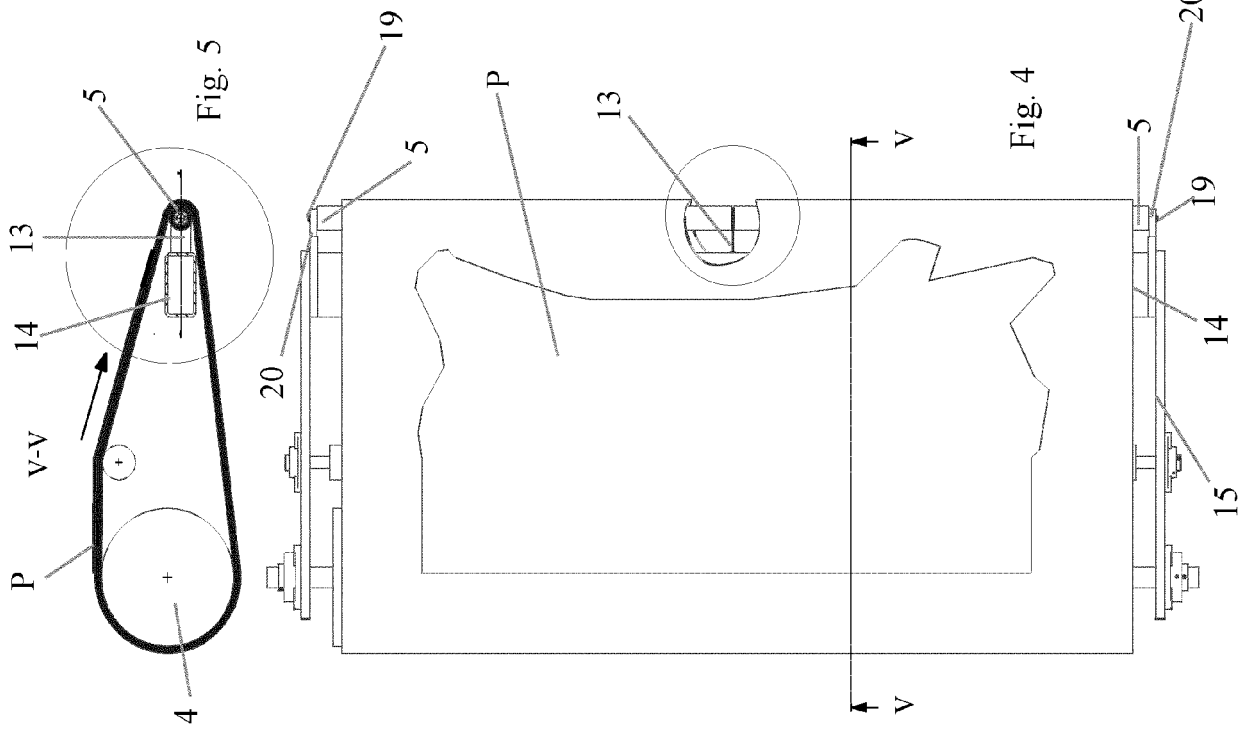
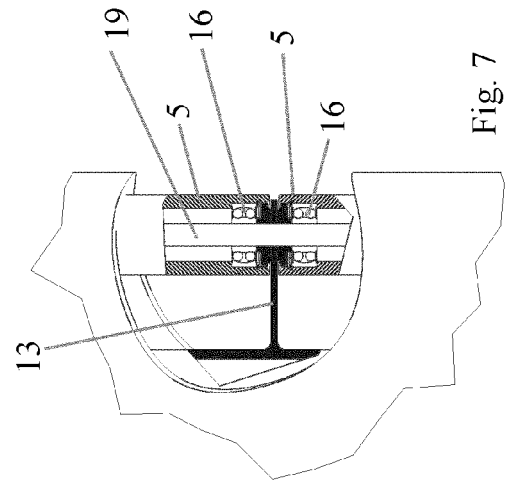
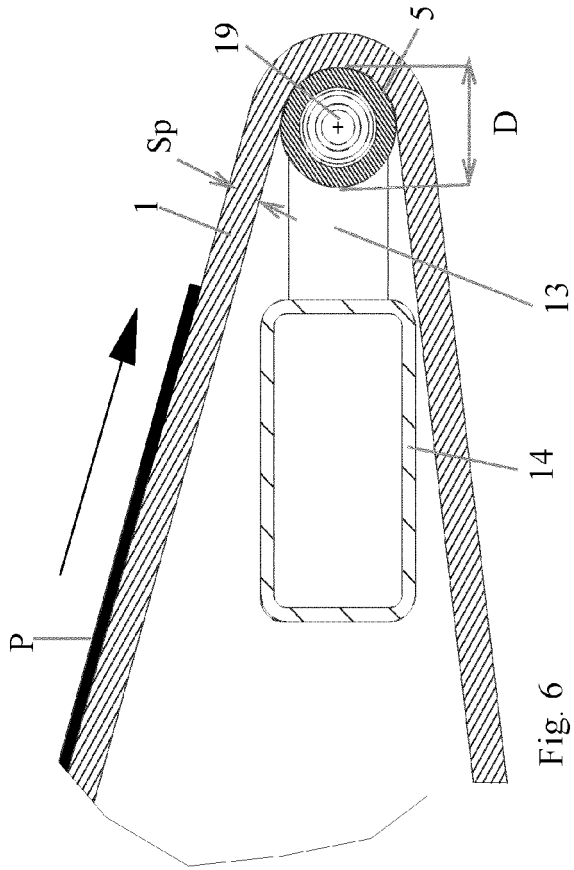
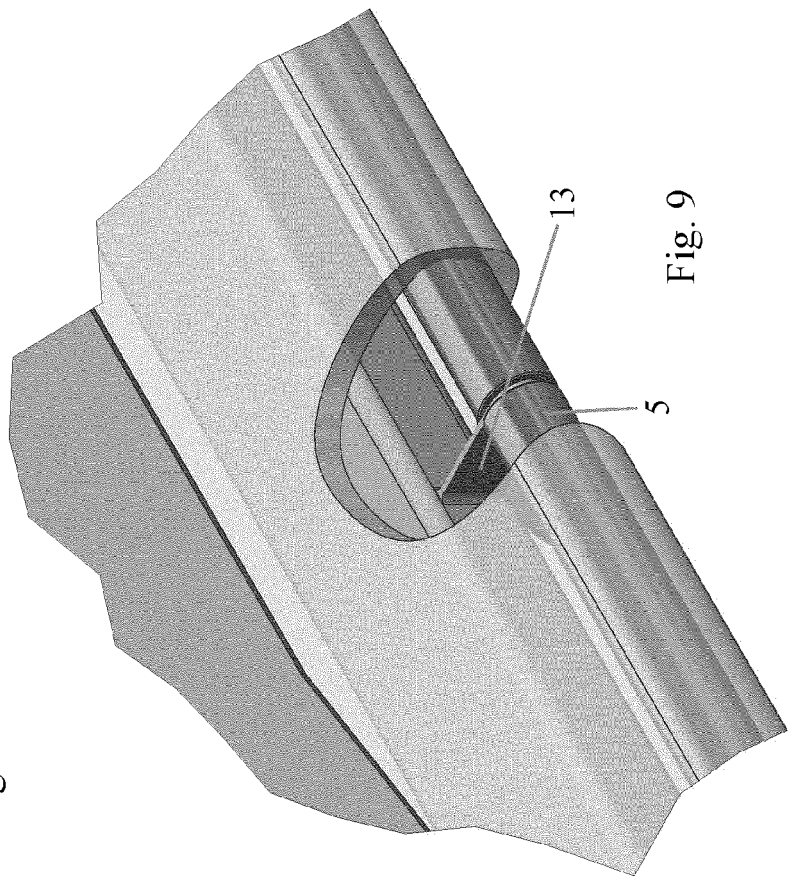
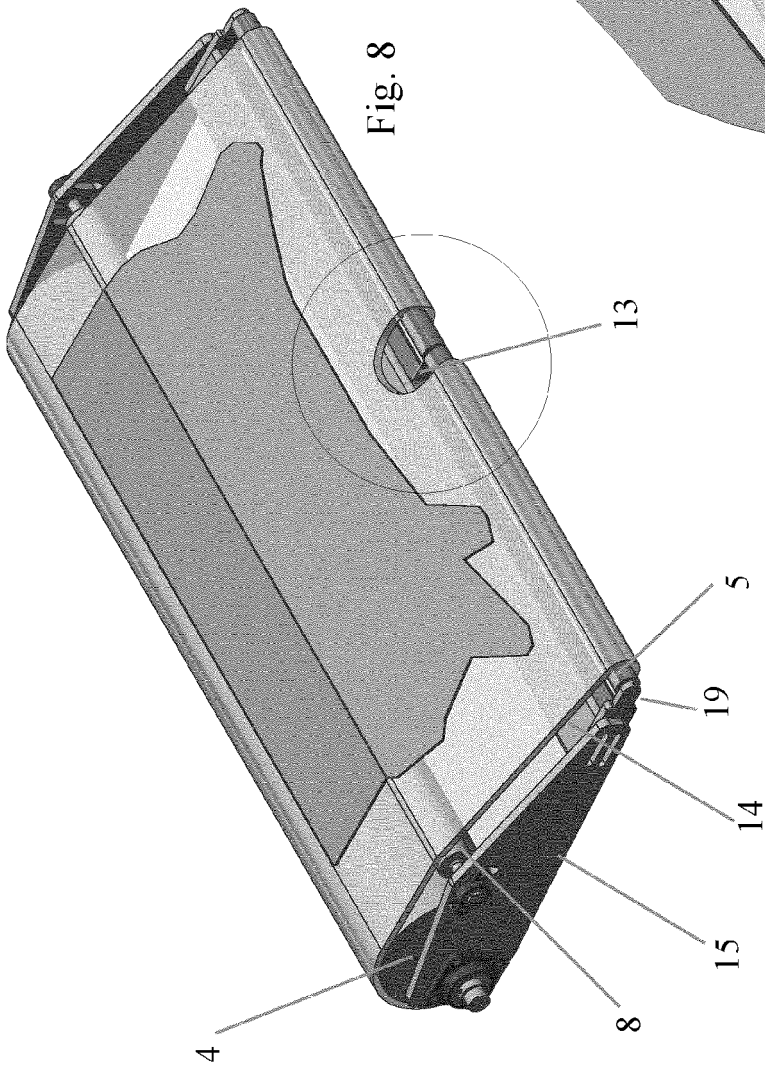
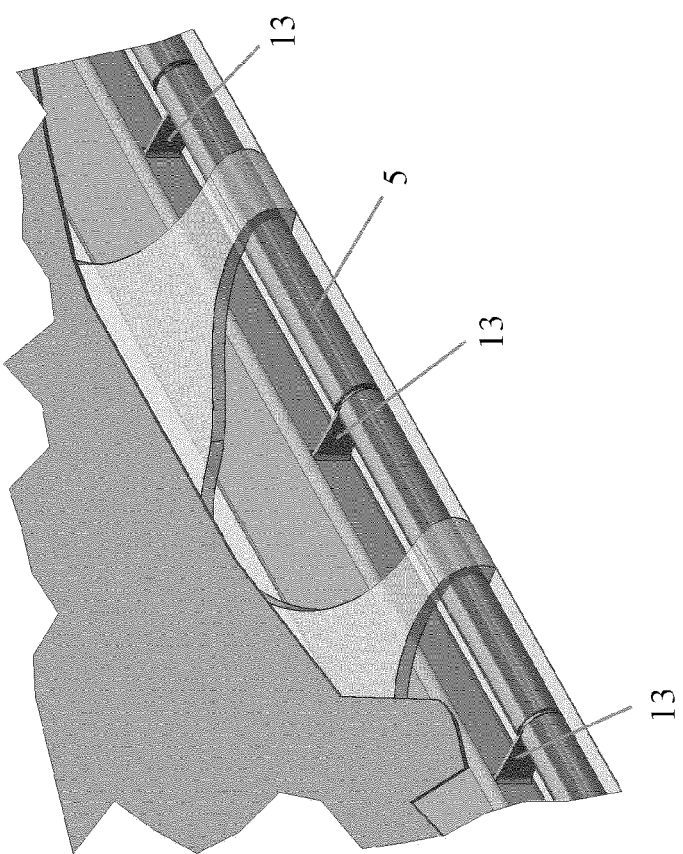
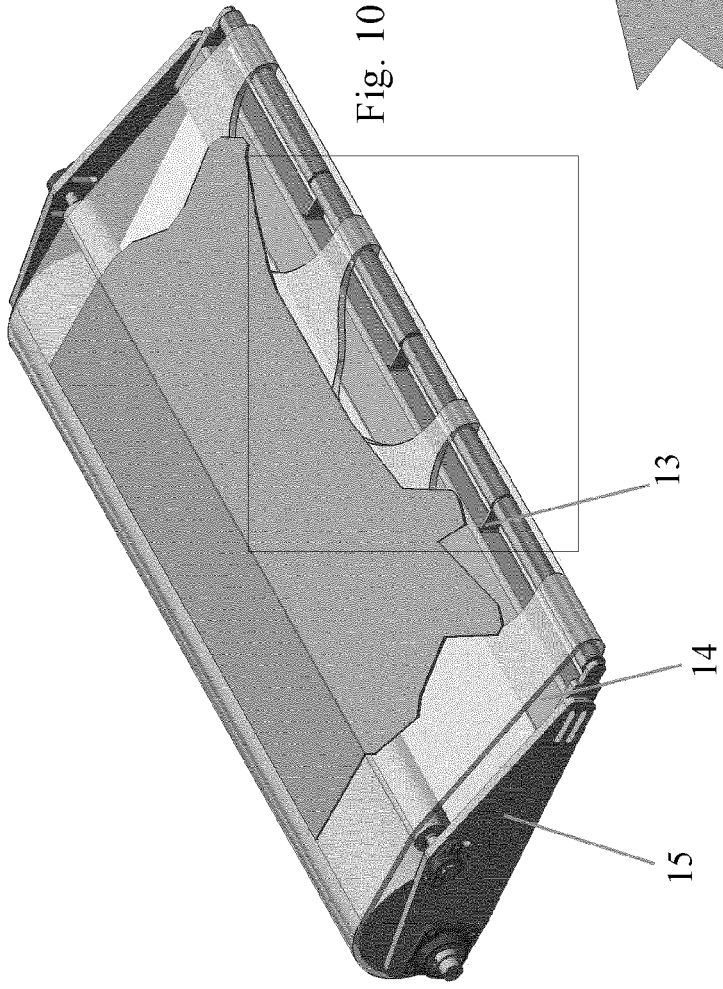


Fig. 3









EUROPEAN SEARCH REPORT

Application Number
EP 21 15 5427

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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A	----- KR 101 151 279 B1 (.) 14 June 2012 (2012-06-14) * abstract; figures 1,3 *	1-13	C14B1/56 C14B7/06 C14B17/06 C14C11/00 C14C15/00
A	----- EP 3 599 289 A2 (DMS INTERNATIONAL SOC A RESPONSABILITA LIMITATA SEMPLIFICATA [IT]) 29 January 2020 (2020-01-29) * paragraph [0070]; figures 7,11,17 *	1-13	
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			TECHNICAL FIELDS SEARCHED (IPC)
			C14B B05C C14C B41L B41F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 June 2021	Examiner Iamandi, Daniela
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 21 15 5427

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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22-06-2021

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