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(54) METHOD AND APPARATUS FOR PROCESSING A FIBRE WEB

VERFAHREN UND VORRICHTUNG ZUR BEHANDLUNG EINER FASERSTOFFBAHN

PROCEDE ET DISPOSITIF DE TRAITEMENT D'UNE BANDE DE MATIERE FIBREUSE

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(56) References cited:
WO-A1-97/13035
WO-A1-03/004769
US-A- 5 865 953
US-A1- 2004 045 687
US-B1- 6 401 355

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Description

[0001] The present invention relates to a method according to the preamble of Claim 1 for processing a fibre web, which method includes the spreading of a size mixture on a board web in particular. The invention can also be applied to paper webs and other similar fibre webs.

[0002] The invention also relates to an arrangement according to the preamble of claim 11, intended to apply the method.

[0003] The application relates to sizing and the processing of a web by calendering. Hereinafter the invention is described using as an example sizing in particular.

[0004] The term size usually refers to a water-starch mixture, which is spread on the surface of board or paper and is pressed inside the web, for example, in a nip between rolls. Size is used to increase the strength of the web. Size also improves the surface properties and printability of paper. In addition to starch, the size mixture can also include many additives while in some cases latex can also be used as the binder in the size. In principle, the present invention can be applied to all size mixtures and to different kinds of fibre web. The strength of the product is one of the most important properties of some board grades, such as the liner and fluting used in the manufacture of corrugated board. Because the use of size can, among other things, considerably increase the bending and surface strengths, the aim is to use large amounts of size in these board grades. At present, a greater application amount is achieved using pond-application devices, but their greatest running speed is too low for modern requirements. Therefore, in modern board machines, film-transfer application is used to spread the size. In film-transfert application the size is spread, first of all, on the surface of a film-transfer roll, by means of which it is transferred to the web. In board machines, simultaneous two-sided application is often used, in which case the web travels through a nip formed by two film-transfer rolls. Each roll has its own application beam. Using these devices, it is possible to achieve a reasonably large application amount on the surface of one web, expressed as wet film of 30 - 35 g/m^2.

[0005] Film-transfer coaters have, however, limitation which reduce their efficiency and economy. Thanks to the nip pressure obtained in the nip of the film-transfer rolls, good size penetration into the fibre structure of the web is obtained, but the length of the nip is, however, quite short, so that the actual absorption of the size into the web only takes place after the nip. Because in practice the drying of the size must be started immediately after the nip, so that the web is made touch dry and can be controlled, the total absorption time remains short. Even though even large amounts of processing agent can be spread on the web using a film-transfer spreader or spreaders, a pond can arise between the surface of the web and the surface of the film-transfer roll. The creation of the pond causes the detriment of splashing at high web speeds, but a pool can arise easily even at low speeds. The creation of this so-called mini-pond limits the greatest application amount, because the pond causes splashing, web vibration, and, when it rapidly rotates, even the penetration of air through the nip. In a film-transfer nip, the web becomes wet with the great amount of size, which leads to runnability problems. When it becomes wet, the web weakens so that it can tear more easily. In addition, the wetting and drying change the dimensions of the web and the changes in dimension must be taken into account by adjusting the web tension and possibly by using spreader rolls. The application chambers of film-transfer coaters are designed quite precisely, to ensure an even spread of size. However, material continually detaches from the surface of a fibre web, which can travel either directly on the surface of the film-transfer roll or along with the machine circulation into the application chamber. This causes disturbances, particularly when it gets under the doctor rod, and can even block the application, chamber. Further, the doctor rods and their cradles bounding the application chamber, as well as the roll surfaces wear rapidly, which leads to short service intervals. This causes direct maintenance costs and a reduction in production due to service breaks. These problems are emphasized in machines using recycled fibre, because there are always foreign substances in the fibre that cause wear, the most important of which being sand and particularly abrasive pigment-coating particles. Because recycled fibre is an important raw material in the manufacture of board, these problems become emphasized especially in machines used in the manufacture of board. During application, air and impurities can easily enter the machine circulation of the coater, and must be removed by efficient air removers and filter devices. These devices are expensive and the necessary machine circulation becomes long and its capacity large.

[0006] The problems and limitations appearing in film-transfer application have different emphases in the manufacture of different products. It is obvious that the danger of a web break will not be as great in board grades as it will be with thinner papers, possibly made from recycled fibre. On the other hand, when making printing paper or board, there is less dirtying and wear of the devices.

[0007] An example for a method for making corrugated paper is known from US 5 865 953 A, wherein a pulp material sheet is formed, the pulp material sheet is partially dried and an effective amount of a crack-reducing agent is applied to the surfaces of the partially dried sheet using a size press. Here, the crack-reducing agent is absorbed in the partially dry sheet. Further, the partially dried sheet is dried after applying the crack-reducing agent, whereby absorption of the crack-reducing agent inhibits formation of cracks when the paper is corrugated.

[0008] The invention has the object to create a method and apparatus by which it is possible to spread processing agent on a moving fibre web with an amount that can be varied in wide range, the agent being surface size,

and to avoid the limitations present in application by conventional film transfer- or pond press sizer.

[0009] The invention is intended to provide a method and arrangement, with the aid of which separate drying after application and the following pressing in a nip can be avoided.

[0010] The object of the invention is achieved by a method having the features of claim 1 and an arrangement having the features of claim 11 of the invention.

[0011] The invention is based on the processing-agent mixture being spread on at least one surface of the web using a spray-application devices, after which the web is led into a nip between two moving surfaces at a distance from the spreading point. Further, according to one embodiment of the invention the web is led after application to a nip, in which at least one surface that is in contact with the web is heated.

[0012] More specifically, the method according to the invention is characterized by what is stated in the characterizing portion of Claim 1.

[0013] The arrangement according to the invention, in turn, is characterized by what is stated in the characterizing portion of Claim 11.

[0014] Considerable advantages are gained with the aid of the invention.

[0015] The most important advantage of the invention is the variable amount of application over a very large area. In particular, the large application amount makes the method according to the invention more advantageous than previous methods. Thanks to the long delay time, even a large amount of size mixture has time to set on the surface of the web and inside the web and not to be pressed out in the nip of the rolls. In principle, with the aid of the method, it is possible to use as large an amount of size as desired, at least within the scope of the limitations of existing known sized products. If necessary, a large application amount permits the manufacture of new types of products. The amount of size and the profile can be adjusted with the aid of the feed amount of the nozzles or by changing the nozzle size. The delay is adjusted simply by altering the distance between the application unit and the press rolls. The final adjustment of the penetration of the size is made by altering the nip pressure of the press rolls' nip.

[0016] Preferably application is performed simultaneously on both sides of the web, in which case only one application station and the dryers it requires will be needed. There is no problem in spreading different amounts of size mixture on each side of the web or using different processing-agent mixtures on each side of the web. The method also permits double application directly onto the wet surface. This is carried out by the roll nip being formed in the normal film-transfer-unit manner, in such a way that the press rolls have conventional application beams, so that a second layer of size is transferred to the web in the roll nip. The processing-agent mixture can be spread hot on the surface of the web, in which case it will be more fluid than usual and dry and set more quickly on the surface of the web. The evaporation of water is also promoted by the fact that the web can be brought hot to the application device directly form the dryer.

[0017] The calender nips can also be used as the roll nip, for example, in such a way that one of the rolls is a soft roll and the other a heated roll. Correspondingly, one or both of the rolls can be replaced with belts, or the nip can be formed from a shoe calender. Thanks to the heated roll or belt and the long, preferably adjustable delay, drying after pressing can be eliminated, if the drying effect transferred in the nip to the web is sufficient. In that case, it is possible with the aid of the invention to substitute application, nip pressing of the application, calendering, and drying with only application and a hot calender nip. In particular, the expensive floating or infrared dryers are then eliminated and the purchase cost of the system can be reduced and it can be fitted into a small space, which is advantageous particularly when rebuilding a manufacturing line. In connection with sizing, particular attention must be paid to the selection of the materials of the hot surfaces, so that adhesion will be avoided.

[0018] In addition to the above advantages, the weaknesses of sizing with a film-transfer press are avoided, these being the insufficient penetration of the size to the web, i.e. limitations in the strength of the product, getting a large amount of size through the film-transfer nip, i.e. the avoidance of too much of a pond forming in the roll nip, and the rapid wear of the application rods and rod cradles and roll surfaces, particularly in recycled-fibre machines. Because there are no application chambers, blockage of the chambers with material detaching from the web is avoided. Material detaching from the web does not enter the machine circulation, so that the processing-agent mixture needs not be filtered in order to remove impurities. A return circulation is usually not even needed, because all of the application mixture can be directed to the web. If excess processing agent must be collected from the rolls or the spray chamber, it can be led in a simple manner back to the feed tank. The amounts are then small and the necessary transfer devices cheap. In addition to these, pond presses have the weakness of the speed limit imposed by splashing from the pond, which limits the possibility to use them at the web speeds demanded nowadays.

[0019] In the following, the invention is examined with the aid of examples and with reference to the accompanying drawings.

Figure 1 shows a schematic view of one embodiment of the invention.

Figure 2 shows a schematic view of a second embodiment: of the invention.

Figure 3 shows a detail of Figure 2.

[0020] The sizing station according to the invention shown in Figure 1 is fitted to a manufacturing line. In the

direction of travel of the web 1, first comes a dryer-cylinder group 2, from which the web 1 is guided directly to the application device 3. After the application device 3, follow the press rolls 4 and an air dryer 5, from where the web 1 is guided to finishing. Between the dryer-cylinder group 2 and the application device 3 there are measuring devices 6, which are used to monitor the web 1.

[0021] The application device 3 comprises press rolls 8 mounted in bearings in a frame 7, which form a nip, through which the web 1 being processed travels. The rolls 8 and the frame 7 can be parts of a conventional film-transfer coater, so that in this respect the application device corresponds to a film-transfer coater, from which the application devices of the rolls 8 have been removed. The web 1 is guided to run directly downwards to the rolls 8 through web guide rolls 9. The area between the web guide rolls 9 and the press rolls 8 is enclosed by a casing 10 on both sides of the web. The web 1 thus travels in a space enclosed by the web guide rolls 9, the press rolls 8, and the casing 10. The edges of the web 1 and the possible gaps can be sealed using rubber or sheet-metal sealing strips. The necessary lumber of spray nozzles 11 for spreading a size mist on the surface of the web are located inside the casing 10. Pressure-dispersion nozzles are used as the spray nozzles 11, by means of which an even coverage is obtained while there is no drying effect of a dispersing gas. The pressure of the nozzles can be quite low, usually less than 1 Mpa, usually about 1-10 bar. In this embodiment, a size recovery system is not required, because the size mixture than condenses in the chamber on the walls of the casing or the mist in the chamber will drop or flow onto the press rolls 8 and from there onto the web 1. The walls of the casing 10 can be heated, in which case the size mist that adheres to the walls will not dry. If the size mixture flowing onto the press rolls 8 causes faults in the web 1, the excess size mixture can be collected, for instance, using channels in the lower part of the casing 10 and led back to the machine circulation or to the pulper.

[0022] If necessary, several rows of spray nozzles can be used. In that case, if one nozzle row is out of operation, for example during washing, running can continue using the other nozzles. The device according to the invention is most advantageous when used in two-sided sizing, but naturally application on only one side can be used if desired. During web breaks and other production breaks, the nozzle beam turns away from the casing to the wash trough and if required, for example, though. 180DEG or 90DEG,so that the nozzles can be checked, washed, or replaced. The walls of the casing can preferably be opened for washing.

[0023] In the embodiment described above, the delay time can be adjusted by altering the position of the nozzle rows in the casing 10. In that case, however, the casing will become large and the adjustment distance usually short.

[0024] In the solutions according to Figures 2 and 3, the entire nozzle casing 10 is moved relative to the press rolls 8. In this embodiment, the web 1 is guided from the guide roll 9 directly to the nip of the press rolls 8, in such a way that both sides of the web come into contact with the press rolls 8 simultaneously. This makes the delay and distance between application and pressing the same on both sides of the web 1. The nozzle casing 10 is arranged on a base 13 in a guide 12 running parallel to the web 1 and can be moved along the guide, in order to change the distance between the size-mixture spreading point and the nip between the press rolls 8. The length of this guide 12 can even be quite great. In practice, the length of the guide 12 and the greatest delay are only limited by the available space and how long a free draw of the web can be taken over while remaining under control.

[0025] According to the invention, the delay is adjusted in order to form the desired amount of processing agent on the web after the nip. This adjustment can take place by altering at one time the amount of processing agent or other manufacturing or quality factors of the product, such as the web speed, the material of the base web, or similar. Alternatively, the adjustment can be made continuously on the basis of measurement. The adjustment can be based on the measurement of the amount of process agent after the nip, the profile, or the quality of the surface, or even on adjustment that takes place according to the web speed.

[0026] In the nozzle casing 10, there are nozzle beams 14 on both sides of the web 1. The teachings presented in the above examples apply to the operation, location, and maintenance of the nozzles 11. However, the construction of the nozzle casing 10 is different, because the rolls 8, 9 do not seal the inside of the casing 10 from the environment. The web 1 comes to the casing 10 through a narrow entry gap 15. The air that is transported with the web 1 forms a high pressure in the narrow gap and prevents the size mist from entering the casing through it. Air does not significantly enter the casing through the narrow gap 15, nor is the operation of the nozzles disturbed. In this case, the nozzles 11 are oriented in the same direction as the web 1, so that the spray 16 of the nozzle will be pulled along with the air transported by the web 1 and will come onto the web 1. In the trailing direction of the direction of travel of the web 1 there is also a narrow exit gap 19. This gap 19 is bounded on both sides by heated chambers 17. The task of these chambers is to prevent the size mixture from drying in the area of the trailing direction of the web 1. Instead of chambers, a heated plate or even an unheated surface can be used. The excess processing-agent mist is removed through outlet channels 18 arranged in the sides of the heated chambers. If necessary, vacuum can be used to remove the mist, or it small excess pressure can be created inside the casing with the aid of the air brought by the web. Air can be blown into the exist gap on the trailing side of the web, for example, using a device like an air doctor, in order to prevent the mist from escaping. According to this embodiment, the separate size-spreading device can be

arranged to operate in any position of the web at all, so that the threading of then web I is quite free, as long as there is a sufficiently long straight section before the press rolls.

[0027] Within the scope of the invention, the mixture spread on the web 1 should be wet when it arrive at the press-roll nip. In this case, the term wet refers to the fact that with the aid of the nip pressure it will still be possible to affect the penetration of the size into the web, i.e. the size mixture can be pressed inside the fibre layer. Otherwise there will be no benefit from the nip. With the aid of the distance between the spreading of the size mixture and the press nip and the press-nip pressure, the penetration into the web 1 is adjusted as desired. The size mixture can of course also be spread on the web at a fixed distance from the nip, but in that case a substantial part of the adjustability will be lost. When it is made, the size mixture is usually hot, about 50 - 85°C, and the size can be heated in order to maintain it at that temperature, either using a heat exchanger prior to the size being fed to the nozzles, or even electrically in the nozzles, or even with the air of a circulating heating medium in the nozzle beam. The heating of the size will reduce its viscosity, improve drop formation in the nozzle, and promote the evaporation of water on the surface of the web. Because the web comes from the final roll of the dryer-roll group, it is usually quite hot, so that the water will effectively be evaporated from the hot size mixture striking the hot web surface.

[0028] Instead of the rolls of a film-transfer press being used in the method, it is possible to use, for instance a. calender nip, in which one roll has a soft surface and the other roll is a heated hard roll. Both rolls can also be soft or hard and one or more rolls can be heated. If the rolls are different to each other, two roll nips may be needed. In that case, however, the effect of the later roll nip on the penetration of the processing agent will be small, because the surface of the web may dry after the first roll nip. Instead of a roll nip it is possible to use a belt or shoe calender, which comprises one or two consecutive nips. If a metal belt is used in the calender, the belt can easily be heated or cooled to alter the surface properties of the web.

[0029] The invention is highly suitable for use in rebuilding or replacing an existing pond size press or a film-transfer press. In that case, the technology required to form the pond is removed, or correspondingly the application chambers and size circulations. These application methods are replaced according to the invention by placing a spray-application beam before the roll nip. A rebuild of this kind is relatively cheap and with its aid the running speed and amount of processing-agent used can be substantially increased. Thanks to the greater amounts of processing agent, the device can be used to manufacture a wider product range than previously.

Claims

1. Method for processing a paper or board web (1), the method comprising the following steps:

   leading the web (1) to be processed from the last cylinder of a dryer-cylinder group (2) to a nip formed by two press rolls (8), and
   applying such an amount of processing mixture onto at least one side of the web (1) by spray nozzles (11) arranged between the dryer-cylinder group (2) and said nip, such that the processing mixture on the web (1) is still wet when it enters said nip,

   characterized in that
   said processing mixture is a size mixture,
   said spray nozzles (11) are pressure-dispersion nozzles, and
   the method further comprises the step of pressing the processing mixture into the web (1) in said nip.

2. Method according to claim 1, wherein the processing mixture is applied from the spray nozzles (11) onto both sides of the web (1) before the web (1) enters said nip.

3. Method according to any one of the above claims, wherein at least the amount of processing mixture remaining on the web (1) is altered by altering the distance between the spray nozzles (11) and the nip in order to alter the delay time between them and the degree of setting of the processing mixture on the web.

4. Method according to any one of the above claims, wherein the processing mixture is heated prior to being applied from the spray nozzles (11) onto the surface of the web (1) .

5. Method according to any one of the above claims, wherein the size mixture is spread onto the web (1) from at least one surface of the press rolls (8) forming said nip, in order to lead size mixture to said nip and onto the surface of the web (1).

6. Method according to any one of the above claims, wherein said press rolls (8) for forming said nip are the rolls of a film-transfer press.

7. Method according to any one of the above claims, wherein the surface of at least one roll is soft or hard.

8. Method according to any one of the above claims, wherein at least one roll can be heated or cooled.

9. Method according to claim 8, wherein, with the aid of the heated roll, such a large amount of heat is

transferred to the web (1) that drying is not needed after said nip.

10. Method according to any one of the above claims, wherein the web is calendered in said nip after the application.

11. Arrangement for processing a paper or board web (1), by means of which arrangement a processing mixture is applied onto the surface of the web (1), and which arrangement comprises
a nip formed by two press rolls (8),
elements for taking the web (1) to said nip (8), and spray nozzles (11) arranged between a dryer-cylinder group (2) and said nip for applying the processing mixture onto at least one side of the web (1) in such a way that that the processing mixture on the web (1) is still wet when it enters said nip,
characterized in that
said processing mixture is a size mixture,
said spray nozzles (11) are pressure-dispersion nozzles, and
the processing mixture is pressed into the web (1) in said nip.

12. Arrangement according to claim 11, wherein the spray nozzles (11) are arranged on both sides of the web (1).

13. Arrangement according to any one of claims 11 or 12, wherein the arrangement further comprises an element for heating the processing mixture prior to being applied onto the web (1).

14. Arrangement according to any one of claims 11 to 13, wherein the arrangement further comprises an element for spreading the processing mixture onto the surface of one of the rolls (8).

15. Arrangement according to any one of claims 11 to 14, wherein the spray nozzles (11) are located in a casing (10) .

16. Arrangement according to claim 15, wherein the casing (10) can be moved relative to said nip.

17. Arrangement according to any one of claims 11 to 16, wherein the web (1) is guided to said nip between the two press rolls (8) which are the rolls of a film-transfer press.

18. Arrangement according to any one of claims 11 to 17, wherein the surface of at least one roll is soft or hard.

19. Arrangement according to any one of claims 11 to 18, wherein at least one roll (8) can be heated or cooled.

Patentansprüche

1. Verfahren zum Behandeln einer Papierbahn oder Kartonbahn (1), wobei das Verfahren die folgenden Schritte aufweist:

Führen der zu behandelnden Bahn (1) von dem letzten Zylinder einer Trockner-Zylindergruppe (2) zu einem Spalt, der durch zwei Presswalzen (8) ausgebildet ist, und
Aufbringen einer derartigen Menge an Behandlungsgemisch auf zumindest eine Seite der Bahn (1) durch Sprühdüsen (11), die zwischen der Trockner-Zylindergruppe (2) und dem Spalt angeordnet sind, dass das Behandlungsgemisch auf der Bahn (1) noch nass ist, wenn es in den Spalt hineingelangt,
dadurch gekennzeichnet, dass
das Behandlungsgemisch ein Leimgemisch ist,
die Sprühdüsen (11) Druckdispersionsdüsen sind, und
das Verfahren des Weiteren den folgenden Schritt aufweist:

Pressen des Behandlungsgemischs in die Bahn (1) in dem Spalt.

2. Verfahren gemäß Anspruch 1, wobei das Behandlungsgemisch von den Sprühdüsen (11) auf beide Seiten der Bahn (1) aufgebracht wird, bevor die Bahn (1) in den Spalt hineingelangt.

3. Verfahren gemäß einem der vorherigen Ansprüche, wobei zumindest die Menge an Behandlungsgemisch, die an der Bahn (1) verbleibt, geändert wird durch ein Ändern des Abstandes zwischen den Sprühdüsen (11) und dem Spalt, um die Verzögerungszeit zwischen ihnen und dem Grad an Erstarren des Behandlungsgemischs auf der Bahn zu ändern.

4. Verfahren gemäß einem der vorherigen Ansprüche, wobei das Behandlungsgemisch erwärmt wird, bevor es aus den Sprühdüsen (11) auf die Oberfläche der Bahn (1) aufgebracht wird.

5. Verfahren gemäß einem der vorherigen Ansprüche, wobei das Leimgemisch auf die Bahn (1) von zumindest einer Oberfläche der Pressrollen (8), die den Spalt ausbilden, verteilt wird, um das Leimgemisch zu dem Spalt und zu der Oberfläche der Bahn (1) zu führen.

6. Verfahren gemäß einem der vorherigen Ansprüche, wobei die Presswalzen (8) zum Ausbilden des Spaltes Rollen einer Filmübertragungspresse sind.

7. Verfahren gemäß einem der vorherigen Ansprüche,

wobei die Oberfläche von zumindest einer Walze weich oder hart ist.

8. Verfahren gemäß einem der vorherigen Ansprüche, wobei zumindest eine Walze erwärmt oder gekühlt werden kann.

9. Verfahren gemäß Anspruch 8, wobei mit der Hilfe der erwärmten Walze eine derart große Menge an Wärme zu der Bahn (1) übertragen wird, dass ein Trocknen nach dem Spalt nicht erforderlich ist.

10. Verfahren gemäß einem der vorherigen Ansprüche, wobei die Bahn in dem Spalt nach dem Aufbringen kalandriert wird.

11. Anordnung zum Behandeln einer Papierbahn oder Kartonbahn (1), wobei mittels der Anordnung ein Behandlungsgemisch auf die Oberfläche der Bahn (1) aufgebracht wird, und wobei die Anordnung Folgendes aufweist:

einen Spalt, der durch zwei Presswalzen (8) ausgebildet ist,
Elemente zum Befördern der Bahn (1) zu dem Spalt (8), und
Sprühdüsen (11), die zwischen einer Trockner-Zylindergruppe (2) und dem Spalt angeordnet sind, zum Aufbringen des Behandlungsgemisches auf zumindest eine Seite der Bahn (1) in einer derartigen Weise, dass das Behandlungsgemisch auf der Bahn (1) noch nass ist, wenn es in den Spalt hineingelangt,
dadurch gekennzeichnet, dass
das Behandlungsgemisch ein Leimgemisch ist,
die Sprühdüsen (11) Druckdispersionsdrüsen sind, und
das Behandlungsgemisch in die Bahn (1) in dem Spalt gepresst wird.

12. Anordnung gemäß Anspruch 11, wobei die Sprühdüsen (11) an beiden Seiten der Bahn (1) angeordnet sind.

13. Anordnung gemäß einem der Ansprüchen 11 oder 12, wobei die Anordnung des Weiteren ein Element zum Erwärmen des Behandlungsgemisches, bevor es auf die Bahn (1) aufgebracht wird, aufweist.

14. Anordnung gemäß einem der Ansprüchen 11 bis 13, wobei die Anordnung des Weiteren ein Element aufweist zum Verteilen des Behandlungsgemisches auf der Oberfläche einer der Walzen (8).

15. Anordnung gemäß einem der Ansprüche 11 bis 14, wobei die Sprühdüsen (11) in einem Gehäuse (10) angeordnet sind.

16. Anordnung gemäß Anspruch 15, wobei das Gehäuse (10) relativ zu dem Spalt bewegt werden kann.

17. Anordnung gemäß einem der Ansprüche 11 bis 16, wobei die Bahn (1) zu dem Spalt zwischen den beiden Presswalzen (8) geführt wird, die die Walzen einer Filmübertragungspresse sind.

18. Anordnung gemäß einem der Ansprüche 11 bis 17, wobei die Oberfläche von zumindest einer Walze weich oder hart ist.

19. Anordnung gemäß einem der Ansprüche 11 bis 18, wobei zumindest eine Walze (8) erwärmt oder gekühlt werden kann.

Revendications

1. Procédé de traitement d'une bande (1) de papier ou de carton, le procédé comprenant les étapes suivantes :

conduite de la bande (1) devant être traitée du dernier cylindre d'un groupe de cylindres sécheurs (2) jusqu'à une ligne de contact formée par deux rouleaux presseurs (8), et
application d'une quantité de mélange de traitement sur au moins un côté de la bande (1) par des buses de pulvérisation (11) agencées entre le groupe de cylindres sécheurs (2) et ladite ligne de contact, de manière à ce que le mélange de traitement sur la bande (1) soit encore humide lorsqu'elle pénètre dans ladite ligne de contact,
caractérisé en ce que
ledit mélange de traitement est un mélange d'encollage,
lesdites buses de pulvérisation (11) sont des buses de dispersion à pression, et
le procédé comprend en outre l'étape de pressage du mélange de traitement dans la bande (1) dans ladite ligne de contact.

2. Procédé selon la revendication 1, dans lequel le mélange de traitement est appliqué à partir des buses de pulvérisation (11) sur les deux côtés de la bande (1) avant que la bande (1) ne pénètre dans ladite ligne de contact.

3. Procédé selon l'une quelconque des revendications ci-dessus, dans lequel au moins la quantité de mélange de traitement restant sur la bande (1) est modifiée en modifiant la distance entre les buses de pulvérisation (11) et la ligne de contact afin de modifier le délai entre celles-ci et le degré de prise du mélange de traitement sur la bande.

4. Procédé selon l'une quelconque des revendications ci-dessus, dans lequel le mélange de traitement est chauffé avant d'être appliqué à partir des buses de pulvérisation (11) sur la surface de la bande (1).

5. Procédé selon l'une quelconque des revendications ci-dessus, dans lequel le mélange d'encollage est étalé sur la bande (1) à partir d'au moins une surface des rouleaux presseurs (8) formant ladite ligne de contact, afin de conduire le mélange d'encollage jusqu'à ladite ligne de contact et sur la surface de la bande (1).

6. Procédé selon l'une quelconque des revendications ci-dessus, dans lequel lesdits rouleaux presseurs (8) pour former ladite ligne de contact sont les rouleaux d'une presse de transfert de films.

7. Procédé selon l'une quelconque des revendications ci-dessus, dans lequel la surface d'au moins un rouleau est souple ou dure.

8. Procédé selon l'une quelconque des revendications ci-dessus, dans lequel au moins un rouleau peut être chauffé ou refroidi.

9. Procédé selon la revendication 8, dans lequel, à l'aide du rouleau chauffé, une quantité tellement grande de chaleur est transférée à la bande (1) qu'un séchage n'est pas nécessaire après ladite ligne de contact.

10. Procédé selon l'une quelconque des revendications ci-dessus, dans lequel la bande est calandrée dans ladite ligne de contact après l'application.

11. Agencement de traitement d'une bande (1) de papier ou de carton, au moyen duquel agencement un mélange de traitement est appliqué sur la surface de la bande (1), et lequel agencement comprend
une ligne de contact formée par deux rouleaux presseurs (8),
des éléments pour amener la bande (1) jusqu'à ladite ligne de contact (8), et
des buses de pulvérisation (11) agencées entre un groupe de cylindres sécheurs (2) et ladite ligne de contact pour appliquer le mélange de traitement sur au moins un côté de la bande (1) de manière à ce que le mélange de traitement sur la bande (1) soit encore humide lorsqu'elle pénètre dans ladite ligne de contact,
caractérisé en ce que
ledit mélange de traitement est un mélange d'encollage,
lesdites buses de pulvérisation (11) sont des buses de dispersion à pression, et
le mélange de traitement est pressé dans la bande (1) dans ladite ligne de contact.

12. Agencement selon la revendication 11, dans lequel les buses de pulvérisation (11) sont agencées sur les deux côtés de la bande (1).

13. Agencement selon l'une quelconque des revendications 11 ou 12, dans lequel l'agencement comprend en outre un élément pour chauffer le mélange de traitement avant qu'il ne soit appliqué sur la bande (1).

14. Agencement selon l'une quelconque des revendications 11 à 13, dans lequel l'agencement comprend en outre un élément pour étaler le mélange de traitement sur la surface d'un des rouleaux (8).

15. Agencement selon l'une quelconque des revendications 11 à 14, dans lequel les buses de pulvérisation (11) sont situées dans un boîtier (10).

16. Agencement selon la revendication 15, dans lequel le boîtier (10) peut être déplacé par rapport à ladite ligne de contact.

17. Agencement selon l'une quelconque des revendications 11 à 16, dans lequel la bande (1) est guidée jusqu'à ladite ligne de contact entre les deux rouleaux presseurs (8) qui sont les rouleaux d'une presse de transfert de f i lms .

18. Agencement selon l'une quelconque des revendications 11 à 17, dans lequel la surface d'au moins un rouleau est souple ou dure.

19. Agencement selon l'une quelconque des revendications 11 à 18, dans lequel au moins un rouleau (8) peut être chauffé ou refroidi.

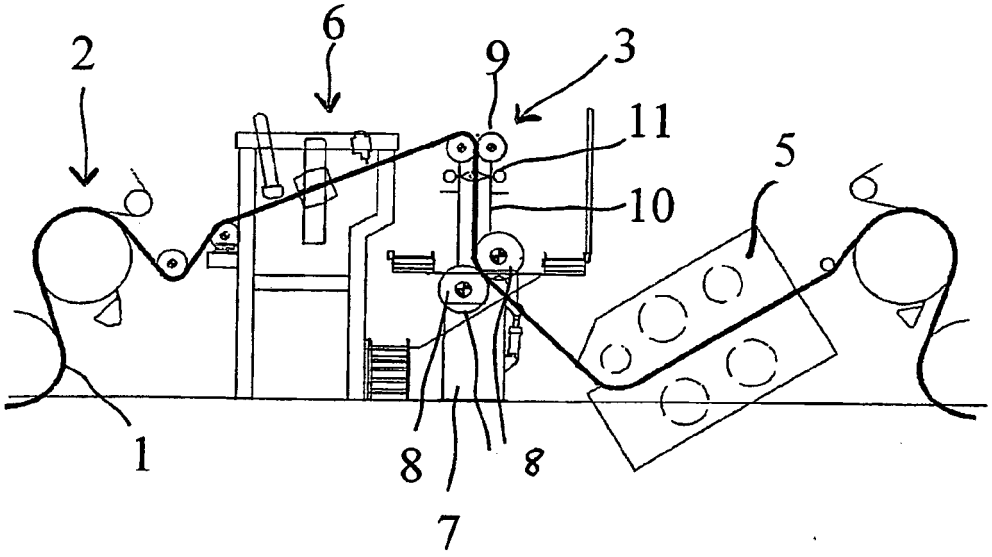


Fig. 1

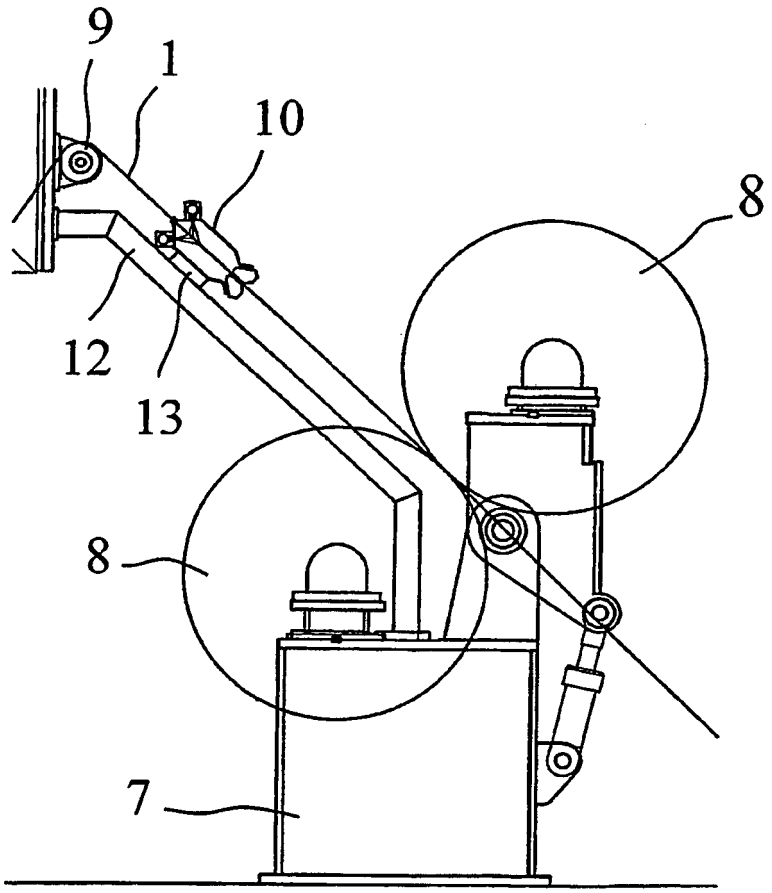


Fig. 2

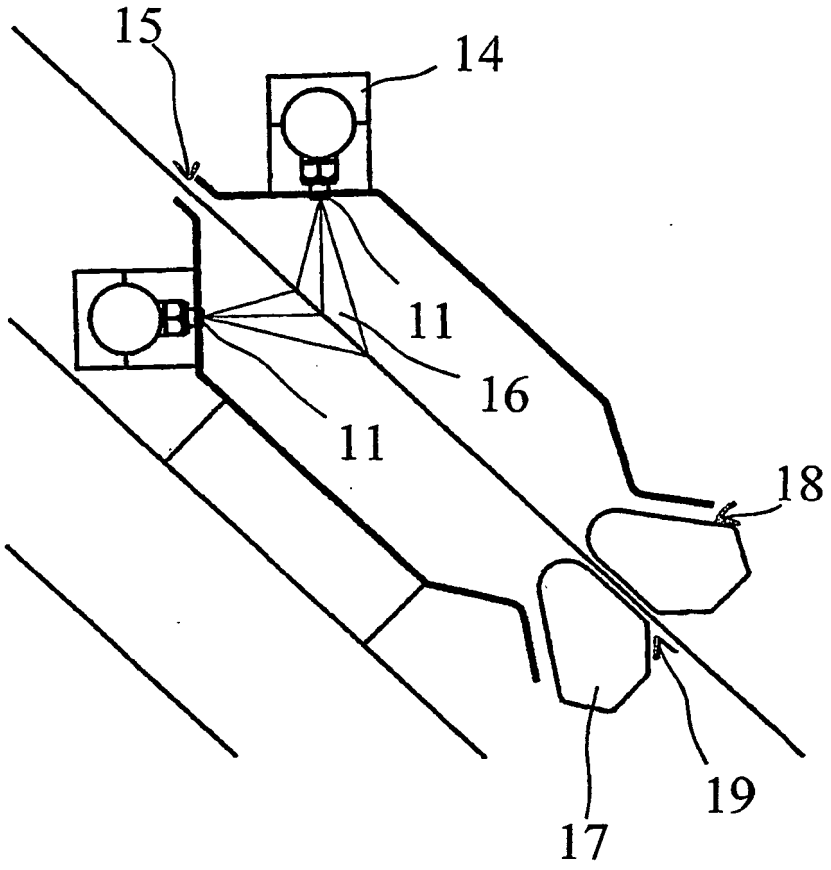


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5865953 A **[0007]**