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(54) A method and apparatus for transferring sheet files

Verfahren und Apparat zum Überführen von Blattstößen

Méthode et appareil pour transférer des liasses de feuilles

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Description

[0001] The present invention relates to a method of and an apparatus for transferring a file of sheets of paper, plastic or like material from the top of a sheet stack to a treatment station, for instance to a vibratory table.

[0002] When cutting paper with the aid of a single-knife guillotine, it is first necessary to separate the sheets with air and then lift the sheets onto the vibratory table in order to shake the sheets into their correct positions before the file can be cut. This is effected fully manually. The sheets may measure 1400 x 1000 m. This means that the file can weigh up to 25-30 kg, depending on the size of the sheets and on the thickness of the file. Three to four files form a cutting file, the weight of which may be of the order of 70-75 kg. In order to cut the sheets correctly and to loosen any sheets that may have fused together, it is necessary to blow air between the sheets before placing the sheets on the vibratory table. A method of and an apparatus for transferring a file of sheets uppermost in a sheet stack to a treatment station, comprising the steps of gripping one edge of the file and swinging the edge upwards-rearwards and rolling the file over a part of the upper surface of the stack and transferring said file to the treatment station have earlier been proposed in EP 0 098 385 A for instance. However, this method is very complicated and consists of no fewer than eleven steps which means that the corresponding apparatus will be very expensive and functional sensitive. It also shows that the problem in question is great.

[0003] The object of the present invention is to solve the aforesaid problem and to provide a method and apparatus for transferring a sheet file from a sheet stack to a treatment station, including loosening of fused sheets and separation thereof by air. This object is achieved with an inventive method and inventive apparatus having the characteristic features set forth in claims 1 and 7.

[0004] Further embodiments of the invention are defined in dependent claims 2 to 6 and 8.

[0005] The invention will now be described in more detail with reference to the accompanying drawing, in which

Fig. 1 is a perspective view which illustrates schematically one step of the inventive method; and
Fig. 2 is a perspective view which illustrates schematically another step of the inventive method.

[0006] Shown in the drawing is a stack of sheets 1 from which a file of sheets is to be loosened and transferred to a treatment station, for instance to a vibratory table. To this end, there is provided at least one clamping device 3 which is mounted on a substantially vertical operating arm 4 for pivotal movement through 180° about a horizontal axle 5. The operating arm 4 can be

moved reciprocatingly in the horizontal plane with the aid of a servo-device. The clamping device 3 is provided with a nozzle for blowing air between the sheets.

[0007] As will be seen from Fig. 1, one edge 6 of the file 2 is gripped and swung upwardly-rearwardly through 180° and drawn in the direction of the arrow 7 while rolling the file 2 over a part of the upper surface of the stack 1. The operating arm 4 is then returned and the file 2 rolled in the opposite direction, back over the upper surface of the stack. As the file of papers is returned, air is blown in between the sheets from the sides thereof so as to air-separate all sheets in the file. The opposing edge 10 of the file may optionally be clamped firmly during this return movement. The folding device intended to hold the sheets firmly at the opposing edge 10 is symbolized by the weight 8 in Fig. 2. The operating arm 4 is now moved in the direction of the arrow 9.

[0008] As before mentioned, the gripping device is operated with servo-assistance, wherein the operator grips a control lever on the operating arm 4 and moves it in the desired direction. The apparatus may be suspended either from a swivel crane, an overhead crane, or may run in tracks.

[0009] The described movement generates shearing between the sheets in the file 2. As the upper outwardly sheared part of the file is held firmly and the rolling movement is partly repeated, the sheets will separate and allow air to flow therebetween.

[0010] Upon completion of the return rolling movement according to arrow 9, the file can either be drawn directly to the treatment station or can be turned by again rolling over the file and then drawn over to the treatment station. Air is suitably blown in beneath the file 2, in order to reduce friction.

Claims

1. A method of transferring a file (2) of sheets of paper, plastic or the like uppermost in a sheet stack (1) to a treatment station, for instance to a vibratory table, comprising the steps of gripping one edge (6) of the file (2) and swinging the edge upwards-rearwards through 180° and rolling the file (2) over a part of the upper surface of the stack (1), and then rolling back the file (2) and transferring said file to the treatment station.
2. A method according to Claim 1, **characterized** by supplying air from the sides of the file during the return rolling movement.
3. A method according to Claim 1 or Claim 2, **characterized** by firmly holding the opposite edge (10) of the file (2) during said return rolling movement.
4. A method according to any one of Claims 1 - 3, **characterized** by passing the file (2) directly to the treatment station after rolling back the file.

5. A method according to any one of Claims 1 - 3, **characterized** by turning the file (2) by re-rolling the same prior to passing the file to the treatment station.
6. A method according to Claim 4 or Claim 5, **characterized** by blowing air in beneath the file (2) as it is transferred to the treatment station.
7. Apparatus for applying the method according to any one of Claims 1 - 6, in which at least one clamping device (3) is mounted on a generally vertical operating arm (4) for pivotal movement through 180° about a horizontal axle (5) and functions to grip one edge (6) of a file (2), wherein said operating arm (4) is servo-assisted for movement in a horizontal plane.
8. Apparatus according to Claim 7, **characterized** in that the clamping device (3) includes air nozzles through which air is blown in between the sheets.

Patentansprüche

1. Verfahren zum Überführen eines aus Papier, Kunststoff oder dgl. bestehenden Bogen gebildeten Stosses (2) von der Oberseite eines Bogenstapels (1) zu einer Verarbeitungsstation, z.B. zu einem Vibrationstisch, gekennzeichnet durch folgende Schritte: Ergreifen der einen Kante (6) des Stosses (2) und Schwenken derselben nach oben und hinten um 180° und Rollen des Stosses (2) über einen Teil der Oberseite des Stapels (1), und anschliessendem Zurückrollen des Stosses (2) und Überführen derselben zur Verarbeitungsstation.
2. Verfahren nach Anspruch 1, gekennzeichnet durch Zufuhr von Luft von den Seiten des Stosses während der Zurückrollbewegung.
3. Verfahren nach Anspruch 1 oder 2, gekennzeichnet durch Festhalten der gegenüberliegenden Kante (10) des Stosses (2) während der Zurückrollbewegung.
4. Verfahren nach einem der Ansprüche 1-3, gekennzeichnet durch direkte Überführung des Stosses (2) zur Verarbeitungsstation nach dem Zurückrollen des Stosses.
5. Verfahren nach einem der Ansprüche 1-3, gekennzeichnet durch Drehen des Stosses (2) durch erneutes Rollen desselben vor dem Überführen des Stosses zur Verarbeitungsstation.
6. Verfahren nach Anspruch 4 oder 5, gekennzeichnet durch Einblasen von Luft unterhalb des Stosses (2) bei dessen Überführung zur Verarbeitungsstation.

7. Vorrichtung zur Durchführung des Verfahrens nach einem der Ansprüche 1-6, bei welcher mindestens eine Greifvorrichtung (3) auf einem weitgehend vertikalen Betätigungsarm (4) zur schwenkbaren Bewegung um 180° um eine Horizontalachse (5) angeordnet ist, und zur Ergreifung einer Kante (6) eines Stosses (2) dient, wobei dieser Betätigungsarm (4) zu Verschiebung in einer Horizontalebene servounterstützt ist.
8. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, dass die Greifvorrichtung (3) mit Luftdüsen versehen ist, durch welche Luft zwischen die Bogen geblasen wird.

Revendications

1. Procédé pour transférer un dossier (2) de feuilles de papier plastique ou similaire situé le plus en haut dans une pile de feuilles (1) vers une station de traitement, par exemple une table vibrante comprenant les étapes de saisir un bord (6) du dossier (2) et de faire pivoter le bord d'avant en arrière sur 180° et de rouler le dossier (2) sur une partie de la surface supérieure de la pile (1), et ensuite de dérouler le dossier (2) et transférer ledit dossier à la station de traitement.
2. Procédé selon la revendication 1, caractérisé en ce qu'on alimente de l'air à partir des côtés du dossier pendant le mouvement de roulement en retour.
3. Procédé selon la revendication 1 ou 2, caractérisé en ce qu'on tient fermement le bord opposé (10) du dossier (2) pendant le mouvement de roulement en retour.
4. Procédé selon l'une quelconque des revendications 1 à 3, caractérisé en ce que l'on fait passer le dossier (2) directement à la station de traitement après avoir déroulé le dossier.
5. Procédé selon l'une quelconque des revendications 1 à 3, caractérisé en ce que l'on fait tourner le dossier (2) en le roulant à nouveau avant de faire passer le dossier à la station de traitement.
6. Procédé selon la revendication 4 ou 5, caractérisé en ce que l'on souffle de l'air par en dessous du dossier (2) lorsqu'il est transféré vers la station de traitement.
7. Appareil pour mettre en oeuvre le procédé selon l'une quelconque des revendications 1 à 6, dans lequel au moins un dispositif de serrage (3) est monté sur un bras travaillant généralement verticalement (4) pour un mouvement de pivotement sur 180° autour d'un axe horizontal (5) et fonctionne

pour saisir un bord (6) d'un dossier (2), dans lequel ledit bras (4) est servo-assisté pour un mouvement dans un plan horizontal.

8. Appareil selon la revendication 7, caractérisé en ce que le dispositif de serrage (3) comprend des buses d'air à travers lesquelles de l'air est soufflé entre les feuilles.

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Fig. 1

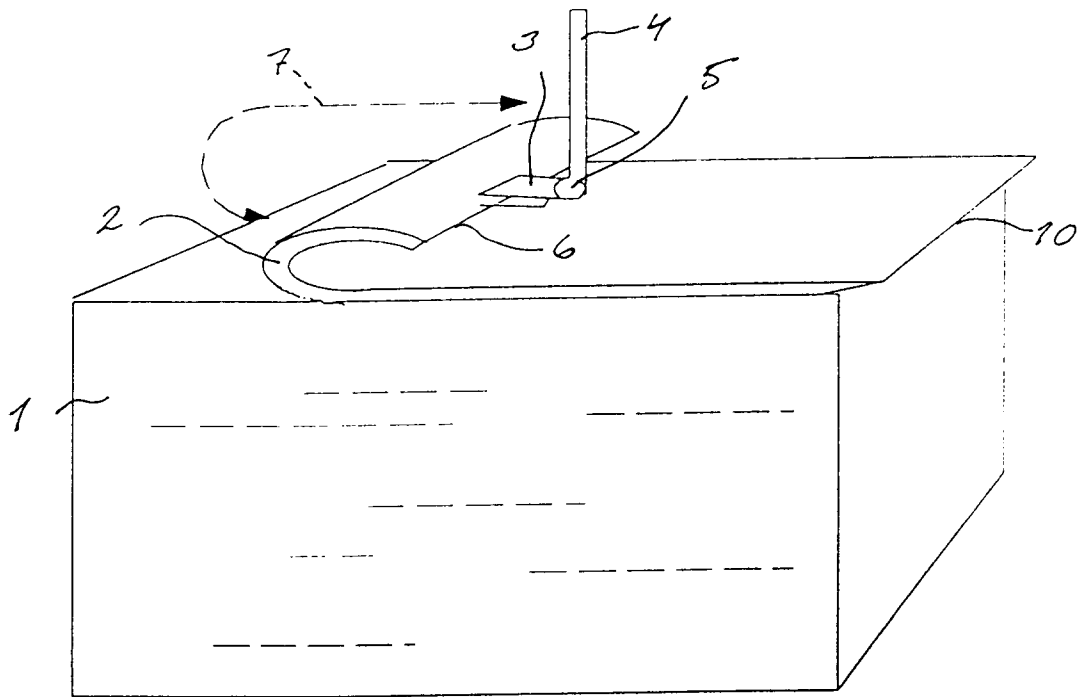


Fig. 2

