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(54) **AUTOMATIC LID BOXING SYSTEM**

AUTOMATISCHES DECKELSYSTEM

SYSTÈME DE MISE EN BOÎTE AUTOMATIQUE DE COUVERCLES

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Description

Technical Area

[0001] The invention relates to a lid boxing system which enables the lids used in the food packaging sector to be automatically filled in the boxes.

State of the Art

[0002] The packaging lids made of cardboard materials are widely used in food industry. In the prior art, the cardboard lids cut in the desired geometric form (hexagonal, pentagonal, circular, etc.) by a cutting machine are removed manually by means of an operator from the cutting machine arranged on a movable car. The operator carries the cut and stacked cardboard lids to the boxing section by the movable car and leaves them into the metal slots by taking them from the car. The cardboard lids which are carried to the boxing section and left into the metal slots are manually filled into the cardboard boxes, which are designed according to the lid form, by operators and the box is closed and the boxing process is completed. Boxes filled with lids and then closed are filled into large cardboard boxes for shipping and ready for shipment. At least two operators are involved in this process, and all the processes are done manually; therefore, the processing time and workmanship are greatly increased. There are also risks such as putting missing lid in the boxes, failure to completely close the openings of the boxes. Thus, the need for an automatic lid boxing system is evident to eliminate existing problems.

[0003] In the patent search, no patent application similar to the system of the invention was found. However, some patents issued in the same technical field are referred to below.

[0004] US5863177 discloses a system for handling lids, the lids being put into a horizontal stack, the horizontal stack of lids being placed onto a tray before being inserted into a carton.

[0005] The patent TR2016/00546 relates to the automatic boxing machine for packaged products, which is characterized by comprising input conveyor, multi-belt conveyor, box opening unit, box positioning conveyor, box filling conveyor, boxing robot, vacuum holder to enable the products in the boxes to be filled in the boxes following the packaging stage. With the aforementioned mechanism, it is not possible to box the cardboard caps.

[0006] As a result, the existence of the problems of the existing applications and the inadequacy of the existing solutions necessitated an improvement in the related technical field.

Objectives of the Invention

[0007] Based on the state of the art, the main object of the invention is to provide a lid boxing system for automatically filling the cardboard lids into the boxes.

[0008] A further object of the invention is to shorten the length of processing times caused by the manual filling of the cardboard lids into the boxes by means of the operators.

5 [0009] A further main object of the invention is to remove the operator and labor required for all processes, such as taking off the cardboard lids from a lid-cutting machine and transporting them to the boxing section, putting them into cardboard boxes and closing the opening portions of the boxes filled with lids and putting them into large cardboard boxes for transportation.

10 [0010] Another main object of the invention is to eliminate the risks such as incompletely placing the lids into the boxes or incompletely closing the openings of the boxes, by means of the automatic lid boxing system. Shortening the processing times is the reduction of labor costs, thus reducing the production costs.

15 [0011] Another object of the invention is to eliminate the hygiene problems, which are caused by the manual placement of the lids in the boxes in the present art, by automatically doing the placement without touching by hand by means of the system of the subject matter of the present invention.

25 Brief Description of the Figures

[0012] Figure 1 is a general perspective view of the automatic lid boxing system according to the invention.

30 Reference Numbers

A Automatic lid boxing system

[0013]

- 35 1. Loading trolley
2. Ground connection part
- 40 3. Connection and movement chassis
4. Lid level adjustment tray
- 45 5. Linear bearing system
6. Motion bearing
7. Cardboard box
- 50 8. Box arranging mould

Detailed Description of the Invention

55 [0014] Figure 1 shows a general perspective view of the automatic lid boxing system (A) according to the invention.

[0015] The automatic lid boxing system (A) according to the invention comprises a loading trolley (1), a ground

connection part (2), a connection and movement chassis (3), a lid level adjustment tray (4), a linear bearing system (5), a motion bearing (6) and box arranging mould (8) on which cardboard boxes (7) are placed.

[0016] The operation of the automatic lid boxing system (A) according to the invention is as follows: Hexagonal cardboard boxes (7), the inside of which are empty, are placed on the upper surface of the box arranging mould (8). The hexagonal cardboard boxes (7) have been used in the preferred embodiment of the invention; however, the invention also covers the use of the cardboard boxes of different geometric shapes, e.g. quadrangular, pentagonal, circular, ellipse, etc., such as to conform to the geometric form of the lids.

[0017] The box arranging mould (8), all the gaps of which are filled with cardboard boxes (7), is then placed in a loading trolley (1). The loading trolley (1) is fixed to the pin locations on a ground connection part (2).

[0018] The box arranging mould (8), which is filled with cardboard boxes (7), is connected to the pin locations in a motion bearing (6) in a way to be able to move upward and downward. The box arranging mould (8) placed on the pin locations is automatically raised with a linear bearing system (5), then the empty loading trolley (1) is removed from the pin locations and thus removed from the system.

[0019] The level of the box arranging mould (8) is adjusted to the outlet section of the lid cutting machine without leaving any gap in-between. Thus, the openings of the cardboard boxes (7) become adjacent to the outlet of the lids. A lid level adjustment tray (4) automatically adjusts the fall level of the lids as the lid fills in the box so that the lids which are cut and fall into the cardboard boxes (7) can fall into the box at short distance. As the lids are filled into the cardboard boxes (7), the lid level adjustment tray (4) automatically lowers. After the cardboard boxes (7) are filled with the lids which are cut, the lid level adjustment tray (4) comes out of the cardboard boxes (7) and reaches the lowest position. Then, the loading trolley (1) and the box arranging mould (8) filled with the lids in are removed from the system. A new box arranging mould (8), in which empty cardboard boxes (7) are placed, is inserted into the system and the above mentioned cycle is repeated.

Claims

1. An automatic lid boxing system (A) which enables lids to be automatically filled into cardboard boxes (7) conforming to the form of the lids, **characterized in that** said automatic lid boxing system (A) comprises

- a box arranging mould (8) in which the cardboard boxes (7) are placed in the gaps on the upper surface thereof,
- a motion bearing (6) to which the box arranging

mould (8), in which the cardboard boxes (7) are placed, is connected in a way to be able to move upward and downward,

- a linear bearing system (5) which allows the box arranging mould (8) to move upward and downward,
- a lid level adjustment tray (4) which automatically adjusts the fall level of the lids which are cut and fall into the cardboard boxes (7).

2. The automatic lid boxing system (A) according to claim 1, **characterized in that** said automatic lid boxing system (A) comprises a loading trolley (1) which enables the box arranging mould, (8) in which cardboard boxes (7) inside of which is filled with lids or empty in are placed, to enter or exit the system and which can be fixed on the pin locations on a ground connection part (2).

3. The automatic lid boxing system (A) according to claim 1, **characterized in that** the cardboard boxes (7) are rectangular, pentagonal, hexagonal, circular, ellipse etc. such as to conform to the geometric form of the lids.

4. A method for automatically filling the lids into the cardboard boxes (7) conforming to the form of the lids by means of an automatic lid boxing system (A), **characterized in that** said method comprises the following stages:

- cardboard boxes (7), inside of which are empty, are placed on the upper surface of a box arranging mould (8),
- the box arranging mould (8), all gaps of which is filled with the cardboard boxes (7) is placed on a loading trolley (1),
- the box arranging mould (8) which is filled with the cardboard boxes (7) is connected to pin locations on a motion bearing (6) in a way to be able to move upward and downward,
- the box arranging mould (8) which is placed on the pin locations is automatically raised up with a linear bearing system (5) and subsequently empty loading trolley (1) is removed from the pin locations (1) and thus removed from the system,
- the level of the box arranging mould (8) is adjusted to the outlet of a lid cutting machine in a way not to remain any gap, thereby the openings of the cardboard boxes (7) are enabled to be adjacent to the outlet of the lids,
- the fall level of the lids which are cut by a lid level adjustment tray (4) and fall into the cardboard boxes (7) are automatically adjusted and lid level adjustment tray (4) lowers as the lids are filled into the cardboard boxes (7),
- the lid level adjustment tray (4) comes out of the cardboard boxes (7) and reaches the lowest

position after the cardboard boxes (7) are filled with the lids which are cut,
 - the box arranging mould (8) inside of which is filled with the lids by the loading trolley (1) is removed from the system and new box arranging mould (8), in which the cardboard boxes (7), inside of which is empty, is placed, is placed into the system.

Patentansprüche

1. Automatisches Deckelverpackungssystem (A), das es ermöglicht, Deckel automatisch in Kartons (7) zu füllen, die der Form der Deckel entsprechen, **dadurch gekennzeichnet, dass** das automatische Deckelverpackungssystem (A) umfasst:

- ein Verpackungs-Anordnungsformwerkzeug (8), in das die Kartons (7) in den Spalten auf der oberen Oberfläche davon platziert werden,
- ein Bewegungslager (6), an dem das Verpackungs-Anordnungsformwerkzeug (8), in dem die Kartons (7) platziert sind, in einer Art verbunden ist, um sich nach oben und unten bewegen zu können,
- ein lineares Lagersystem (5), das es dem Verpackungs-Anordnungsformwerkzeug (8) ermöglicht, sich nach oben und unten zu bewegen,
- eine Deckelebenen-Einstellschale (4), die die Abfallebene der Deckel, die geschnitten werden und in die Kartons (7) fallen, automatisch einstellt.

2. Automatisches Deckelverpackungssystem (A) nach Anspruch 1, **dadurch gekennzeichnet, dass** das automatische Deckelverpackungssystem (A) einen Ladewagen (1) umfasst, der es dem Verpackungs-Anordnungsformwerkzeug (8) ermöglicht, in dem Kartons (7), deren Innenraum mit Deckeln gefüllt oder leer ist, platziert werden, um in das System einzutreten oder dieses zu verlassen, und die an den Stiftstellen an einem Bodenverbindungsteil (2) befestigt werden können.

3. Automatisches Deckelverpackungssystem (A) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Kartons (7) rechteckig, fünfeckig, sechseckig, kreisförmig, ellipsenförmig usw. sind, um mit der geometrischen Form der Deckel übereinzustimmen.

4. Verfahren zum automatischen Füllen der Deckel in die Kartons (7), die mit der Form der Deckel übereinstimmen, mittels eines automatischen Deckelverpackungssystems (A), **dadurch gekennzeichnet, dass** das Verfahren die folgenden Stufen umfasst:

- Kartons (7), deren Innenraum leer ist, werden auf der oberen Oberfläche eines Verpackungs-Anordnungsformwerkzeug (8) platziert,
- das Verpackungs-Anordnungsformwerkzeug (8), dessen gesamte Spalten mit den Kartons (7) gefüllt sind, wird auf einen Ladewagen (1) gelegt,
- das Verpackungs-Anordnungsformwerkzeug (8), das mit den Kartons (7) gefüllt ist, wird mit Stiftstellen an einem Bewegungslager (6) in einer Art verbunden, um sich nach oben und unten bewegen zu können,
- das Verpackungs-Anordnungsformwerkzeug (8), das auf den Stiftstellen platziert ist, wird mit einem linearen Lagersystem (5) automatisch angehoben und anschließend wird ein leerer Ladewagen (1) von den Stiftstellen (1) entfernt und somit aus dem System entfernt,
- die Ebene des Verpackungs-Anordnungsformwerkzeug (8) wird auf den Auslass einer Deckelschneidemaschine in einer Art eingestellt, dass keine Spalte verbleibt, wodurch die Öffnungen der Kartons (7) an den Auslass der Deckel angrenzen können,
- die Fallebene der Deckel, die durch eine Deckelebenen-Einstellschale (4) geschnitten werden und in die Kartons (7) fallen, wird automatisch eingestellt und die Deckelebenen-Einstellschale (4) senkt sich ab, wenn die Deckel in die Kartons (7) gefüllt werden,
- die Deckelebenen-Einstellschale (4) kommt aus den Kartons (7) heraus und erreicht die niedrigste Position, nachdem die Kartons (7) mit den geschnitten Deckel gefüllt sind,
- das Verpackungs-Anordnungsformwerkzeug (8), dessen Innenraum mit den Deckeln durch den Ladewagen (1) gefüllt wird, wird aus dem System entfernt, und ein neues Verpackungs-Anordnungsformwerkzeug (8), in das die Kartons (7), deren Innenraum leer ist, platziert werden, wird in das System platziert.

Revendications

1. Système automatique de mise en boîte de couvercles (A) permettant de remplir automatiquement des couvercles dans des boîtes en carton (7) épousant la forme des couvercles, **caractérisé en ce que** ledit système automatique de mise en boîte de couvercles (A) comprend

- un moule d'agencement de boîtes (8) dans lequel les boîtes en carton (7) sont placées dans les espaces se trouvant sur sa surface supérieure,
- un palier de mouvement (6) auquel le moule d'agencement de boîtes (8), dans lequel sont

- placées les boîtes en carton (7), est relié de manière à pouvoir se déplacer vers le haut et vers le bas,
- un système de palier linéaire (5) qui permet au moule d'agencement de boîtes (8) de se déplacer vers le haut et vers le bas, 5
 - un plateau de réglage du niveau de couvercles (4) qui règle automatiquement le niveau de chute des couvercles qui sont coupés et tombent dans les boîtes en carton (7). 10
2. Système automatique de mise en boîte de couvercles (A) selon la revendication 1, **caractérisé en ce que** ledit système automatique de mise en boîte de couvercles (A) comprend un chariot de chargement (1) qui permet au moule d'agencement de boîtes (8) dans lequel sont placées des boîtes en carton (7) remplies de couvercles ou vides, d'entrer ou de sortir du système et qui peut être fixé sur les emplacements de broches d'une pièce de raccordement au sol (2). 15 20
3. Système automatique de mise en boîte de couvercles (A) selon la revendication 1, **caractérisé en ce que** les boîtes en carton (7) sont rectangulaires, pentagonales, hexagonales, circulaires, elliptiques, etc. de manière à épouser la forme géométrique des couvercles. 25
4. Procédé de remplissage automatique des couvercles dans les boîtes en carton (7) épousant la forme des couvercles au moyen d'un système automatique de mise en boîte de couvercles (A), **caractérisé en ce que** ledit procédé comprend les étapes suivantes : 30 35
- des boîtes en carton (7) dont l'intérieur est vide sont placées sur la surface supérieure d'un moule d'agencement de boîtes (8),
 - le moule d'agencement de boîtes (8), dont tous les espaces sont remplis avec les boîtes en carton (7), est placé sur un chariot de chargement (1), 40
 - le moule d'agencement de boîtes (8) qui est rempli avec les boîtes en carton (7) est relié à des emplacements de broches sur un palier de mouvement (6) de manière à pouvoir se déplacer vers le haut et vers le bas, 45
 - le moule d'agencement de boîtes (8) qui est placé sur les emplacements de broches est automatiquement soulevé avec un système de palier linéaire (5) et le chariot de chargement vide (1) est ensuite retiré des emplacements de broches (1) et donc du système, 50
 - le niveau du moule d'agencement de boîtes (8) est ajusté à la sortie d'une machine de découpe de couvercles de manière à ne laisser aucun espace, ce qui permet aux ouvertures des 55

boîtes en carton (7) d'être adjacentes à la sortie des couvercles,

- le niveau de chute des couvercles qui sont coupés par un plateau de réglage du niveau de couvercles (4) et tombent dans les boîtes en carton (7) est réglé automatiquement et le plateau de réglage de niveau des couvercles (4) s'abaisse au fur et à mesure que les couvercles sont remplis dans les boîtes en carton (7),
- le plateau de réglage du niveau des couvercles (4) sort des boîtes en carton (7) et atteint la position la plus basse après que les boîtes en carton (7) ont été remplies avec les couvercles coupés,
- le moule d'agencement des boîtes (8) à l'intérieur duquel le chariot de chargement (1) a rempli les couvercles est retiré du système et un nouveau moule d'agencement des boîtes (8), dans lequel sont placées les boîtes en carton (7) vides à l'intérieur, est placé dans le système.

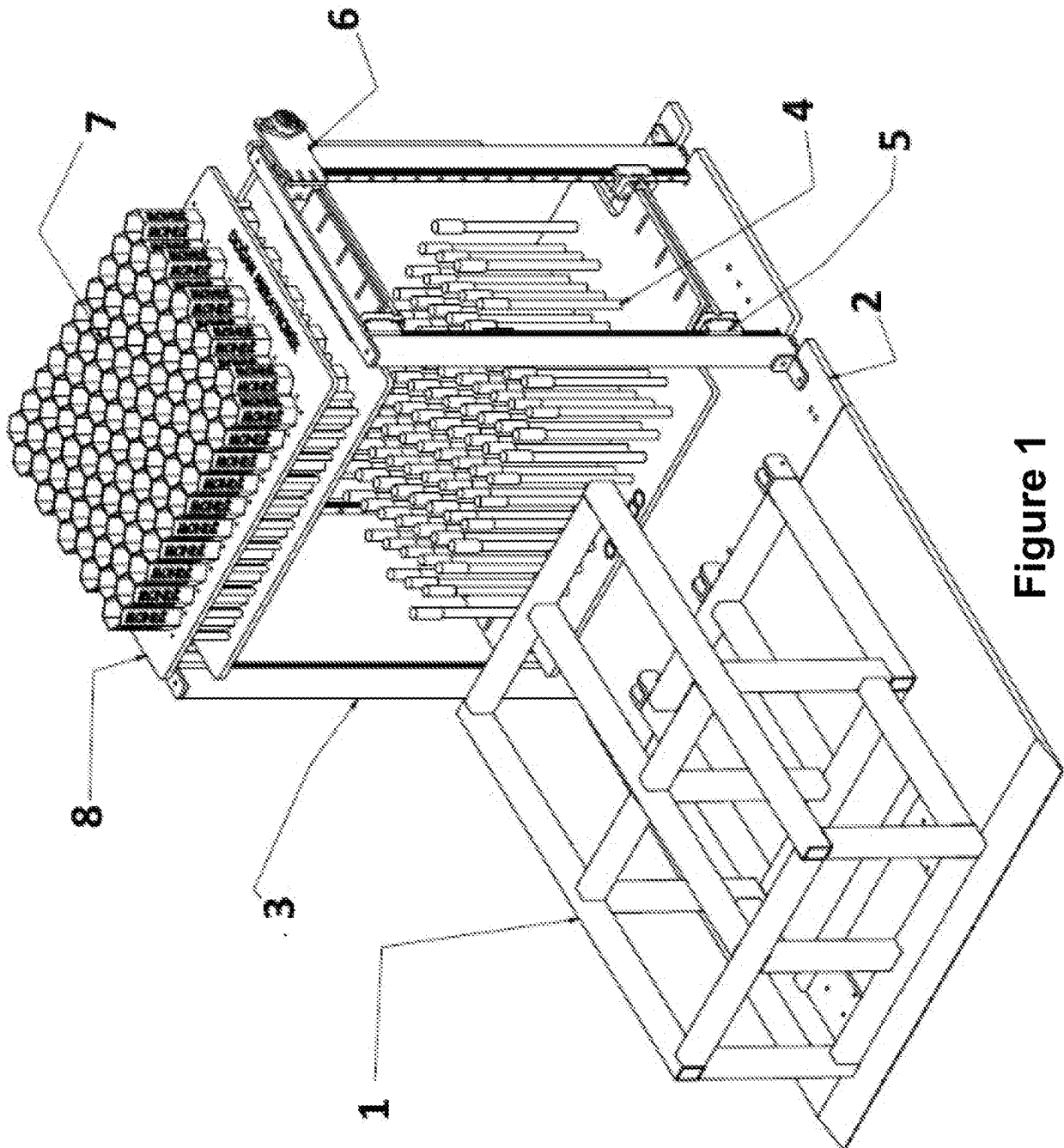


Figure 1

REFERENCES CITED IN THE DESCRIPTION

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