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(54) **COIN WRAPPING MACHINE**

(57) The present invention provides a coin wrapping machine which can reliably wrap coins according to the state of wrapping paper 16 and coin variation, and can satisfy the demand for neat wrapping of even coins that are of the same denomination and the demand for quick wrapping and improvement in process efficiency.

A predetermined number of stacked coins are held by wrapping rollers and rotated, wrapping paper is wrapped around the peripheral surface of the stacked coins, and a pair of crimping hooks are moved toward end faces of the stacked coins and crimp both ends of the wrapping paper 16 around the end faces of the stacked coins. The crimping speed at which both ends of the wrapping paper 16 are folded around the end faces of the stacked coins by the crimping hooks 68 is arbitrarily selected. The rotation speed of the wrapping rollers 67 is adjusted according to a denomination, and the crimping speed of the crimping hooks 68 is adjusted to a selected crimping speed.

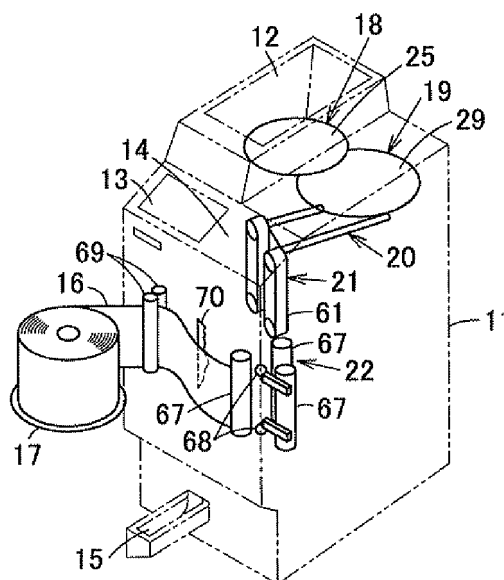


FIG. 1

Description

TECHNICAL FIELD

[0001] The present invention relates to a coin wrapping machine which wraps a predetermined number of stacked coins in wrapping paper.

BACKGROUND ART

[0002] Conventionally, a coin wrapping machine holds a predetermined number of stacked coins by three wrapping rollers, supplies wrapping paper while rotating the stacked coins by driving and rotating the wrapping rollers, wraps the wrapping paper around the peripheral surface of the stacked coins, and then moves a pair of upper and lower crimping hooks closer to the upper and lower end faces of the stacked coins and crimps both upper and lower ends of the wrapping paper around the upper and lower end faces of the stacked coins, and accordingly, wrapped coins are formed.

[0003] Generally, the rotation speed of the wrapping rollers and the crimping speed for crimping both upper and lower ends of wrapping paper around the upper and lower end faces of the stacked coins by moving the pair of upper and lower crimping hooks closer to the upper and lower end faces of the stacked coins are constant regardless of the coin denomination.

[0004] There is available a coin wrapping machine which has rotation speeds of wrapping rollers according to denominations and crimping speeds according to the rotation speeds of the wrapping rollers which are set in advance, and is operated at a rotation speed of wrapping rollers and a crimping speed set for a selected denomination when the denomination to be wrapped is selected by a user. By this coin wrapping machine, according to each denomination, coins can be reliably wrapped, and even if coins are polygonal, the coins can be wrapped (for example, refer to Patent Document 1).

Patent Document 1: Japanese Patent No. 3419670 (page 5, Fig. 1)

DISCLOSURE OF THE INVENTION

Problem to be Solved by the Invention

[0005] However, in this coin wrapping machine, when a denomination is selected, a rotation speed of wrapping rollers and a crimping speed are determined in advance for the denomination, so that depending on the state of wrapping paper and coin variation, wrapping cannot be performed well unless the speeds are changed.

[0006] Even for the same denomination of coins, some users want to neatly wrap, while others want to quickly wrap the coins to improve the process efficiency because neat wrapping takes time, however, these demands cannot be satisfied.

[0007] The present invention has been made in view of these circumstances, and an object thereof is to provide a coin wrapping machine which can reliably wrap coins according to the state of wrapping paper and coin variation, and can satisfy the various demands for the same denomination such as, the demand for neat wrapping as well as the demand for quick wrapping to improve efficiency in process even if wrapping does not become neat.

Means to Solve The Problems

[0008] A coin wrapping machine according to Claim 1 includes: wrapping rollers which wrap wrapping paper around the peripheral surface of a predetermined number of stacked coins; a wrapping roller driving unit which drives and rotates the wrapping rollers; a pair of crimping hooks which move toward end faces of the stacked coins and crimp both ends of the wrapping paper around the end faces of the stacked coins; a hook driving unit which moves these crimping hooks, a crimping speed selecting unit which selects a crimping speed of crimping of both ends of the wrapping paper around end faces of the stacked coins by the crimping hooks; and a control unit which adjusts the crimping speed of the crimping hooks to a crimping speed selected by the crimping speed selecting unit.

[0009] A coin wrapping machine according to Claim 2 includes: in the coin wrapping machine according to Claim 1, a denomination selecting unit which selects a denomination of coins to be wrapped, and the control unit adjusts the rotation speed of the wrapping rollers according to a denomination selected by the denomination selecting unit and adjusts the crimping speed of the crimping hooks to a crimping speed selected by the crimping speed selecting unit.

[0010] With the coin wrapping machine according to Claim 3 of the present invention, in the coin wrapping machine according to Claim 1, the crimping speed selecting unit selects a crimping speed among a plurality of crimping speeds which are set in advance.

Effects of The Invention

[0011] With the coin wrapping machine according to Claim 1 of the present invention, the crimping speed of crimping hooks is adjusted to a crimping speed selected by the crimping speed selecting unit, so that reliable wrapping is possible according to the state of wrapping paper and coin variation, and the demand for neat wrapping of even coins that are of the same denomination and the demand for quick wrapping and improvement in process efficiency even if wrapping does not become neat can be satisfied.

[0012] With the coin wrapping machine according to Claim 2 of the present invention, in addition to the effect of the coin wrapping machine according to Claim 1, the rotation speed of the wrapping rollers is adjusted accord-

ing to a denomination selected by the denomination selecting unit, however, the crimping speed of the crimping hooks is adjusted to a crimping speed selected by the crimping speed selecting unit, so that reliable wrapping is possible according to the state of wrapping paper and coin variation, and additionally, the demand for neat wrapping of even coins that are of the same denomination and the demand for quick wrapping and improvement in process efficiency can be satisfied.

[0013] With the coin wrapping machine according to Claim 3 of the present invention, in addition to the effect of the coin wrapping machine according to Claim 1, the crimping speed selecting unit selects a crimping speed among a plurality of crimping speeds set in advance, so that a crimping speed is easily selected.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Fig. 1 is a perspective view of a coin wrapping machine according to an embodiment of the present invention.

Fig. 2 is a block diagram of the same coin wrapping machine.

Fig. 3 is a plan view of a mechanism inside the same coin wrapping machine.

Fig. 4 is a perspective view of a pair of crimping hooks and a cam shaft of the same coin wrapping machine.

Fig. 5 is a table of the same coin wrapping machine.

REFERENCE NUMERALS

[0015]

- 14 Operation unit as denomination selecting unit and crimping speed selecting unit
- 16 Wrapping paper
- 67 Wrapping roller
- 68 Crimping hook
- 81 Control unit
- 95 Wrapping roller motor as wrapping roller driving unit
- 96 Cam shaft motor as crimping hook driving unit

BEST MODE FOR CARRYING OUT THE INVENTION

[0016] Hereinafter, an embodiment of the present invention will be described with reference to the drawings.

[0017] As shown in Fig. 1, on the upper portion of a machine body 11 of a coin wrapping machine, a hopper 12 into which coins to be processed are input, a display unit 13 which displays a selected denomination and an operation mode etc., and an operation unit 14 as a denomination selecting unit and a crimping speed selecting unit which selects a wrapping mode, a denomination, and a crimping speed, etc., are disposed. On the front portion of the machine body 11, a wrapped coin dispensing unit

15 which dispenses wrapped coins to the outside is disposed. On a side portion of the machine body 11, a wrapping paper supply base 17 which has a rolled wrapping paper 16 which wraps coins arranged thereon and supplies the wrapping paper into the machine body 11 is disposed.

[0018] Inside the machine body 11, a supply unit 18 which supplies coins to the lower side of the hopper 12, a centrifugal disk unit 19 which feeds coins supplied from the supply unit 18 one by one, a path unit 20 which transports coins fed out from the centrifugal disk unit 19, a stacking unit 21 which stacks a predetermined number of coins transported to the terminal end of the path unit 20, and a wrapping unit 22 which prepares wrapped coins by wrapping the predetermined number of stacked coins in the wrapping paper 16 below the stacking unit 21, are disposed.

[0019] Next, Fig. 3 shows the mechanism inside the machine body 11.

[0020] The supply unit 18 has a supply disk 25 and a peripheral wall 26 arranged around the supply disk 25. By rotation of the supply disk 25 which received coins put into the hopper 12, coins are supplied by a predetermined amount each to the centrifugal disk unit 19 through an opening as a part of the peripheral wall 26.

[0021] The centrifugal disk unit 19 has a centrifugal disk 29, a peripheral wall 30 arranged around the centrifugal disk 29, and a thickness restricting member 31 arranged via a gap for allowing coins in a single-layered state in the thickness direction from the upper surface of the centrifugal disk 29 at the connection portion of the path unit 20. By the rotation of the centrifugal disk 29, coins are fed out to the path unit 20 in a single-layered state in the thickness direction through the lower side of the thickness restricting member 31.

[0022] The path unit 20 has a transport path 33 for transporting coins. This transport path 33 includes path bottom plates 34 and 35 arranged to be flush with the upper surface of the centrifugal disk 29, and movable path members 36, 37, and 38 arranged movably in the path width direction on one side and the other side of these path bottom plates 34 and 35. The path bottom plate 35 on the downstream side in the transporting direction is movable in the path width direction integrally with the movable path member 38.

[0023] Above the transport path 33 of the path unit 20, as a transporting belt unit 39 which transports coins inside the path unit 20 toward the downstream side in the transporting direction, a first transporting belt 40 on the upstream side in the transporting direction, and a second transporting belt 41 on the downstream side in the transporting direction are disposed. The first transporting belt 40 is wound across a pulley 42 axially supported rotatably above the path bottom plate 34 and a pulley 43 axially supported rotatably above the path bottom plate 35. The second transporting belt 41 is wound across a pulley 44 axially supported rotatably above the path bottom plate 35 and a pulley 45 axially supported rotatably above the

stacking unit 21. The end portion on the downstream side in the transporting direction of the first transporting belt 40 and the end portion on the upstream side in the transporting direction of the second transporting belt 41 are arranged side by side in the path width direction so as to overlap each other in the transporting direction.

[0024] In the present embodiment, the first transporting belt 40 and the second transporting belt 41 are arranged side by side in the path width direction so as to overlap each other in the transporting direction, and this is for reliable transportation of coins even having a small diameter, and without limiting to this arrangement, the transporting belts 40 and 41 may be arranged in a straight line as long as they can transport coins having a small diameter.

[0025] Inside the path unit 20, under the first transportation belt 40 between the path bottom plate 34 and the path bottom plate 35, a discharge port 47 for discharging coins to be excluded such as coins with diameters smaller than coins of a set denomination for which the path width has been adjusted and unrecognizable coins is opened. Both sides of this discharge port 47 are formed by a movable path member 36 and a movable path member 38, and the opening width of the discharge port 47 varies according to movements of the movable path members 36 and 38.

[0026] In the region of the first transporting belt 40 on the more downstream side in the transporting direction than the discharge port 47, a recognition sensor 48 which recognizes coins and a count sensor 49 which counts coins are disposed.

[0027] In the region in which the first transporting belt 40 and the second transporting belt 41 overlap each other on the more downstream side in the transporting direction than the recognition sensor 48, a stopper 50 which stops coins is disposed. This stopper 50 is allowed to advance into and retreat from the path with respect to the movable path member 38 side according to driving of a solenoid as a stopper drive unit.

[0028] At the terminal end of the path unit 20, a check sensor 51 which detects coins ejected from the terminal end of the path unit 20 is disposed.

[0029] The path width of the movable path members 36 and 38 is adjusted by a path width adjustment unit 53 according to a denomination to be processed by movements of the movable path members 36 and 38 on both sides. This path width adjustment unit 53 supports the movable path member 38 slidably in the path width direction by a plurality of axes 54, and a path width adjusting cam 55 is disposed outside the movable path member 38, and bearings 56 and 57 joined to the movable path members 36 and 38 are made into contact with both sides of the path width adjusting cam 55 corresponding to the path width direction. Then, by turning the path width adjusting cam 55 according to a denomination to be processed and moving the movable path members 36 and 38 in the path width direction, the path width and the opening width of the discharge port 47 can be adjusted.

[0030] The stacking unit 21 includes a pair of stacking belts 61 which are opposed to each other on both sides in the path width direction at the terminal end of the path unit 20 and can rotate in the up-down direction to stack coins, and a stacking guide 62 which holds coins ejected from the terminal end of the path unit 20 at a portion between the pair of stacking belts 61. On the surfaces of the pair of stacking belts 61, a coin support unit 63 on which coins are placed and stacked is provided so as to project.

[0031] By rotating the pair of stacking belts 61 so that the coin support unit 63 moves down as much as one coin each time a coin ejected from the path unit 20 is stacked on the coin support unit 63 of the pair of stacking belts 61, a predetermined number of coins are stacked. The stacked coins are moved to the wrapping unit 22 below.

[0032] As shown in Fig. 1, the wrapping unit 22 includes three wrapping rollers 67, and stacked coins stacked by the stacking unit 21 are arranged and held between the wrapping rollers 67, and while the wrapping rollers are rotated, a predetermined length of wrapping paper 16 is supplied and wrapped around the peripheral surface of the stacked coins, the upper and lower end portions of the wrapping paper 16 are crimped around the upper and lower end faces of the stacked coins by a pair of upper and lower crimping hooks 68 to prepare wrapped coins. The formed wrapped coins are ejected downward and dispensed to the wrapped coin dispensing unit 15.

[0033] For supplying a predetermined length of wrapping paper 16, paper feed rollers 69 which supply wrapping paper 16 and a cutter 70 for cutting a predetermined length of the wrapping paper 16 are provided.

[0034] As shown in Fig. 4, the support units 71 supporting the pair of upper and lower crimping hooks 68 are supported by the support axes 72 slidably in the up-down direction. Near the support axes 72, a cam shaft 73 is arranged rotatably and parallel to the support axes 72, and on this cam shaft 73, the crimping hooks 68 slide in the up-down direction via arms 75 which follows a cam 74. One ends of the arms 75 are supported rotatably at fixed positions by axes 76, the other ends are joined to the support units 71, and the intermediate portions come into contact with and follow the cam 74. One operation for crimping the wrapping paper 16 is completed per one rotation of the cam shaft 73, and at the initial positions, the pair of upper and lower crimping hooks 68 are away from each other, and in response to the start of rotation of the cam shaft, the pair of upper and lower crimping hooks 68 move closer to each other, and after finishing crimping of the wrapping paper 16, the pair of upper and lower crimping hooks 68 move away from each other and return to the initial positions. Further, according to rotation of the cam shaft 73, the pair of upper and lower crimping hooks 68 withdraw from the portion between the three wrapping rollers 67 in a standby state, and enter the portion between the three wrapping rollers 67 when perform-

ing a crimping operation.

[0035] Next, Fig. 2 shows a control unit 81 which controls the coin wrapping machine.

[0036] To this control unit 81, the display unit 13, the operation unit 14, the recognition sensor 48, the count sensor 49, a check sensor 51, the supply unit 18, the centrifugal disk unit 19, the path unit 20, the transporting belt unit 39, the stacking unit 21, the wrapping unit 22, and the storage unit 82 are connected.

[0037] The supply unit 18 includes a supply motor 84 which drives and rotates the supply disk 25.

[0038] The centrifugal disk unit 19 includes a centrifugal disk motor 85 which drives and rotates the centrifugal disk 29.

[0039] The path unit 20 includes a path width motor 86 which drives and rotates a path width adjusting cam 55 and a stopper solenoid 87 as a stopper driving unit which moves the stopper 50. By driving the path width motor 86, the path width is widened and coins are discharged from the discharge port 47.

[0040] The transporting belt unit 39 includes a first motor 89 which drives and rotates the first transporting belt 40 forward and reverse, a second motor 90 which drives and rotates the second transporting belt 41 forward and reverse, and a coin guide motor 91 which raises or lowers the heights of the transporting belts 40 and 41 according to a denomination of coins.

[0041] The stacking unit 21 includes stacking motors 92 and 93 which drive and rotate a pair of stacking belts 61, respectively, and an inner diameter motor 94 which adjusts the distance between the pair of stacking belts 61 according to a denomination of coins.

[0042] The wrapping unit 22 includes a wrapping roller motor 95 as a wrapping roller driving unit which drives and rotates the wrapping rollers 67, a cam shaft motor 96 which rotates the cam shaft 73 by 360 degrees to crimp the end portions of the wrapping paper 16 around end faces of the stacked coins by the upper and lower crimping hooks 68, and a paper feed motor 97 which drives and rotates the paper feed rollers 69.

[0043] The storage unit 82 stores predetermined values such as path widths, rotation speeds of the wrapping rollers 67, and crimping speeds of the wrapping paper 16, etc., set for the respective denominations.

[0044] The operation unit 14 functions as a denomination selecting unit which selects a denomination of coins to be wrapped, and also functions as a crimping speed selecting unit which selects a crimping speed at which both ends of the wrapping paper 16 are crimped around the end faces of the stacked coins by the crimping hooks 68. A crimping speed is selected among a plurality of crimping speeds set in advance and displayed on the display unit 13.

[0045] As shown in Fig. 5, when denominations are A1, A2, A3... Ax, rotation speeds B1, B2, B3... Bx of the wrapping rollers 67 appropriate for the diameters and external shapes of the respective denominations are set. Concerning the crimping speed of the wrapping paper

16, as an initial value, a constant crimping speed C is set for all denominations, however, different crimping speeds C1, C2, C3... Cx for the respective denominations are set so as to be selected, and the speed C or the speed C1, C2, C3... Cx according to the denomination can be selected. Fig. 5 shows an example in which the crimping speeds C1, C2, C3... Cx are selected for the denominations A3, A2, A3... Ax, respectively, however, this is just an example, and other crimping speeds C1, C2, C3... Cx may be arbitrarily selected.

[0046] The rotation speeds B1, B2, B3... Bx and the crimping speeds C1, C2, C3... Cx for the respective denominations A1, A2, A3... Ax are stored in the storage unit 82.

[0047] The control unit 81 has a function to adjust the rotation speed of the wrapping rollers 67 according to a selected denomination, and adjust the crimping speed of the crimping hooks 68 to a selected crimping speed.

[0048] Next, operations and effects of the present embodiment will be described.

[0049] By selecting a wrapping mode and a denomination by the operation unit 14, according to the selected denomination, the path width of the path unit 20, the stacking unit 21, and the wrapping unit 22 are automatically adjusted and set, and the rotation speed of the wrapping rollers 67 is set.

[0050] Further, a crimping speed of the crimping hooks 68 is selected by the operation unit 14. At this time, the display unit 13 displays a plurality of crimping speeds set in advance, and by selecting a speed among these, selection can be easily made.

[0051] Coins are put into the hopper 12 and a start operation is performed by the operation unit 14, and accordingly, the supply disk 25 of the supply unit 18, the centrifugal disk 29 of the centrifugal disk unit 19, and the transporting belts 40 and 41 of the path unit 20 rotate.

[0052] Coins in the hopper 12 are supplied from the supply disk 25 to the centrifugal disk 29, and by the rotation of the centrifugal disk 29, the coins are fed one by one to the path unit 20.

[0053] In the path unit 20, coins fed from the centrifugal disk 29 are scraped out by the first transporting belt 40 into a transport path 33 and transported toward the downstream side in the transporting direction.

[0054] Coins transported in the transport path 33 are recognized by the recognition sensor 48, and normal coins of a denomination to be wrapped are transported to the terminal end of the path unit 20 and ejected to the stacking unit 21, and stacked in the stacking unit 21.

[0055] When a predetermined number of coins are detected by the recognition sensor 48, the next coin is stopped by the stopper 50, and accordingly, the predetermined number of coins are stacked in the stacking unit 21.

[0056] The predetermined number of stacked coins stacked in the stacking unit are moved to the wrapping unit 22, held between the three wrapping rollers 67, and rotated together with the wrapping rollers 67 that are driv-

en and rotated by the wrapping roller motor 95.

[0057] Thereafter, to the portion between the rotating stacked coins and wrapping rollers 67, the tip end of the wrapping paper 16 is supplied, and the wrapping paper 16 is wrapped around the peripheral surface of the stacked coins. The wrapping paper 16 is cut with a cutter 70 into a predetermined length during wrapping.

[0058] At this time, the wrapping rollers 67 are rotating at the rotation speed corresponding to the denomination, so that the wrapping paper 16 can be wrapped around the peripheral surface of the stacked coins at a proper level of tightening.

[0059] Thereafter, the cam shaft 73 is rotated by the cam shaft motor 96 and a crimping operation for crimping the wrapping paper 16 is started. When the cam shaft 73 starts rotating from a fixed position, the pair of upper and lower crimping hooks 68 move closer to each other, and crimp the upper and lower end portions of the wrapping paper 16 around the upper and lower end faces of the stacked coins, and accordingly, wrapped coins are formed. Thereafter, the pair of upper and lower crimping hooks 68 move away from each other and return to the initial positions, and the cam shaft 73 rotates by 360 degrees and stops.

[0060] At this time, the pair of upper and lower crimping hooks 68 crimp the upper and lower end portions of the wrapping paper 16 around the upper and lower end faces of the stacked coins at a selected crimping speed.

[0061] Therefore, for example, as shown in Fig. 5, when the crimping speed of the denomination A1 is the crimping speed C as the initial value, the movement degree of crimping hooks is slightly smaller and neat wrapping is possible, however, when quick wrapping is demanded, by selecting a crimping speed C1 higher than the crimping speed C by the operation unit 14, a proper movement degree of crimping hooks for satisfying the demand can be set. On the other hand, when the crimping speed of the denomination Ax is the crimping speed C as the initial value, the movement degree of crimping hooks becomes slightly larger, so that crimping is easily canceled, and therefore, when neat wrapping is demanded, by selecting a crimping speed Cx slower than the crimping speed C by the operation unit 14, a proper movement degree of crimping hooks for satisfying the demand can be set.

[0062] The wrapped coins prepared by the wrapping unit 22 are ejected downward and dispensed to the wrapped coin dispensing unit 15.

[0063] Thus, the rotation speed of the wrapping rollers 67 is adjusted according to a denomination, however, the crimping speed of the crimping hooks 68 is adjusted to a crimping speed arbitrarily selected regardless of the rotation speed of the wrapping rollers 67, so that reliable wrapping is possible according to the state of the wrapping paper 16 and coin variation, and the various demands for the same denomination such as the demand for neat wrapping as well as the demand for quick wrapping to improve efficiency in process can be satisfied.

[0064] Moreover, a crimping speed is selected among a plurality of crimping speeds set in advance and displayed on the display unit 13, so that selection can be easily made.

INDUSTRIAL APPLICABILITY

[0065] The present invention is applicable to coin wrapping machines which wrap a predetermined number of stacked coins.

Claims

1. A coin wrapping machine comprising:

wrapping rollers which wrap wrapping paper around the peripheral surface of a predetermined number of stacked coins;
a wrapping roller driving unit which drives and rotates the wrapping rollers;
a pair of crimping hooks which move toward end faces of the stacked coins and crimp both ends of the wrapping paper around the end faces of the stacked coins;
a hook driving unit which moves the crimping hooks,
a crimping speed selecting unit which selects a crimping speed of crimping of both ends of the wrapping paper around end faces of the stacked coins by the crimping hooks; and
a control unit which adjusts the crimping speed of the crimping hooks to a crimping speed selected by the crimping speed selecting unit.

2. The coin wrapping machine according to Claim 1, comprising:

a denomination selecting unit which selects a denomination of coins to be wrapped, wherein the control unit adjusts the rotation speed of the wrapping rollers according to a denomination selected by the denomination selecting unit and adjusts the crimping speed of the crimping hooks to a crimping speed selected by the crimping speed selecting unit.

3. The coin wrapping machine according to Claim 1, wherein
the crimping speed selecting unit selects a crimping speed among a plurality of crimping speeds which are set in advance.

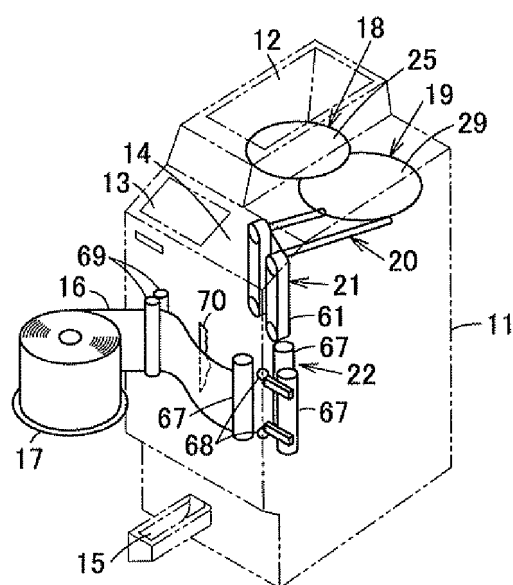


FIG. 1

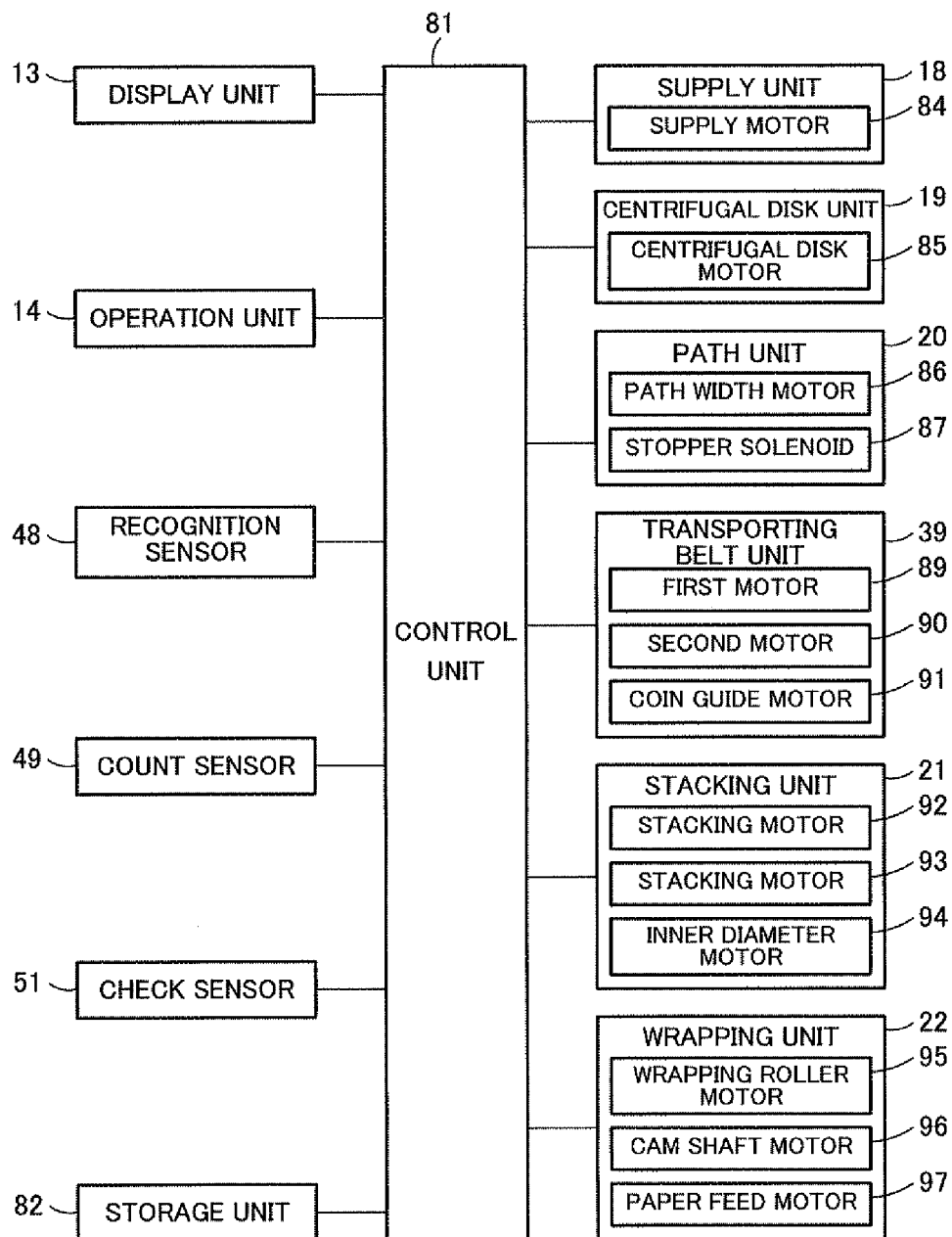


FIG. 2

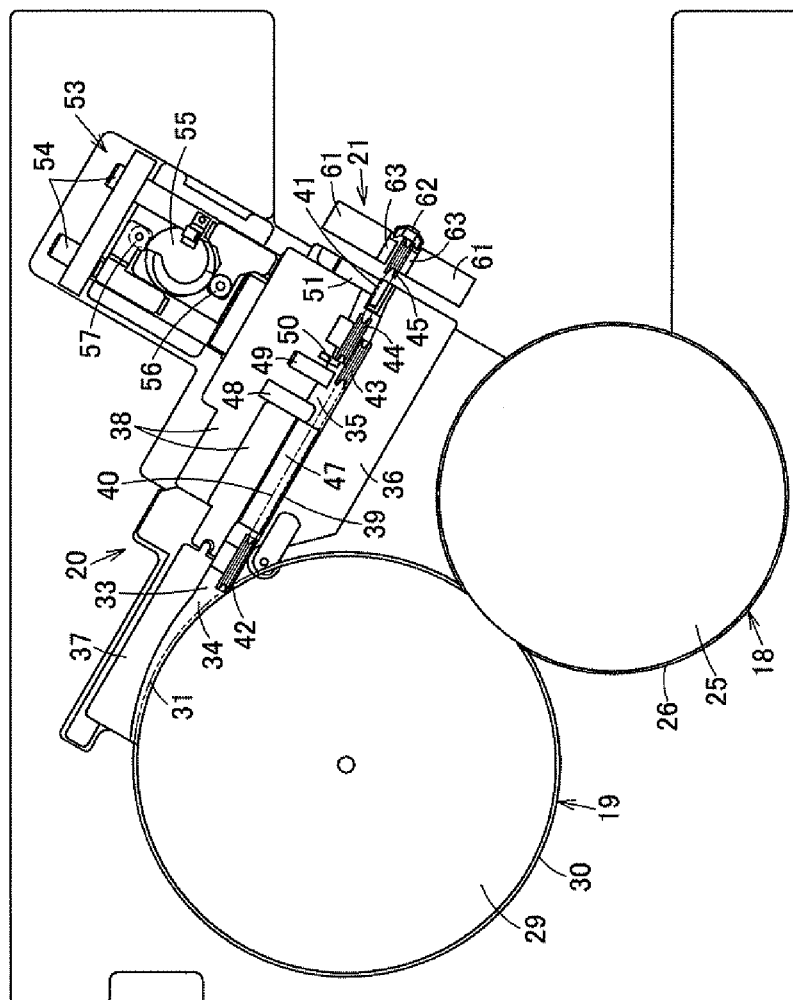


FIG. 3

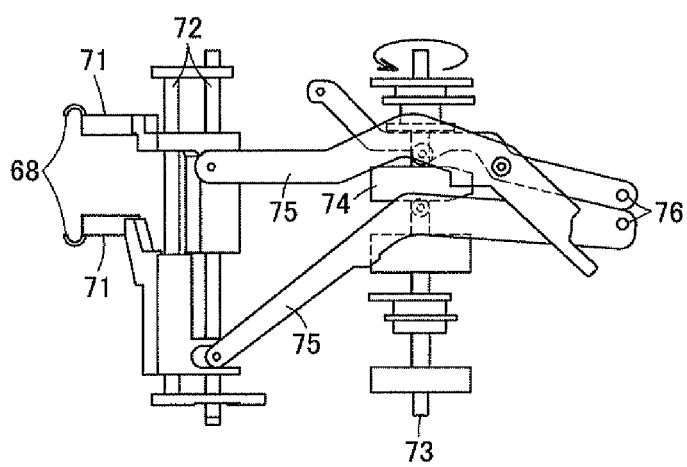


FIG. 4

DENOMINATION	ROTATION SPEED OF WRAPPING ROLLERS	CRIMPING SPEED		MOVEMENT DEGREE OF CRIMPING HOOKS	
		INITIAL VALUE	OPTION	INITIAL VALUE	OPTION
A1	B1	C (CONSTANT)	C1	SLIGHTLY SMALLER	PROPER
A2	B2		C2		PROPER
A3	B3		C3		PROPER
⋮	⋮		⋮		PROPER
A _x	B _x		C _x	SLIGHTLY LARGER	PROPER

FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2008/055840

A. CLASSIFICATION OF SUBJECT MATTER

B65B11/56 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65B11/56

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2008
Kokai Jitsuyo Shinan Koho	1971-2008	Toroku Jitsuyo Shinan Koho	1994-2008

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2000-289705 A (Laurel Bank Machines Co., Ltd.), 17 October, 2000 (17.10.00), Par. Nos. [0007], [0034], [0056] & EP 1043701 A1 & US 6519921 B1	1-3

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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Date of the actual completion of the international search
19 June, 2008 (19.06.08)Date of mailing of the international search report
01 July, 2008 (01.07.08)Name and mailing address of the ISA/
Japanese Patent Office

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Patent documents cited in the description

- JP 3419670 B [0004]