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(54) AUTOMATIC BAG FORMING AND PACKAGING MACHINE

(57) The present invention discloses an automatic stand-up pouch forming and packaging machine and belongs to the field of packaging machinery. The automatic forming and packaging machine comprises a pouch film fixing assembly, a crease forming assembly, a pouch film driving assembly, a pouch making assembly, a longitudinal sealing assembly, a transverse sealing assembly and a box body, wherein a pouch film for packaging can be fixed by the pouch film fixing assembly, creases required for forming the stand-up pouch can be formed by the crease forming assembly through folding, a driving force for enabling the pouch film to move forward can be provided by the pouch film driving assembly, content materials can enter a packaging pouch through the pouch making assembly, the packaging pouch can be longitudinally sealed by the longitudinal sealing assembly and transversely sealed by the transverse sealing assembly, and all the assemblies can be fixed at required positions by the box body. According to the automatic stand-up pouch forming and packaging machine provided by the present invention, the forming of sand-up pouches and the packaging of materials can be performed synchronously, so that the appearance of packages is improved, meanwhile, the production efficiency is increased, the cost of the packages is reduced, and the human labor is also reduced.

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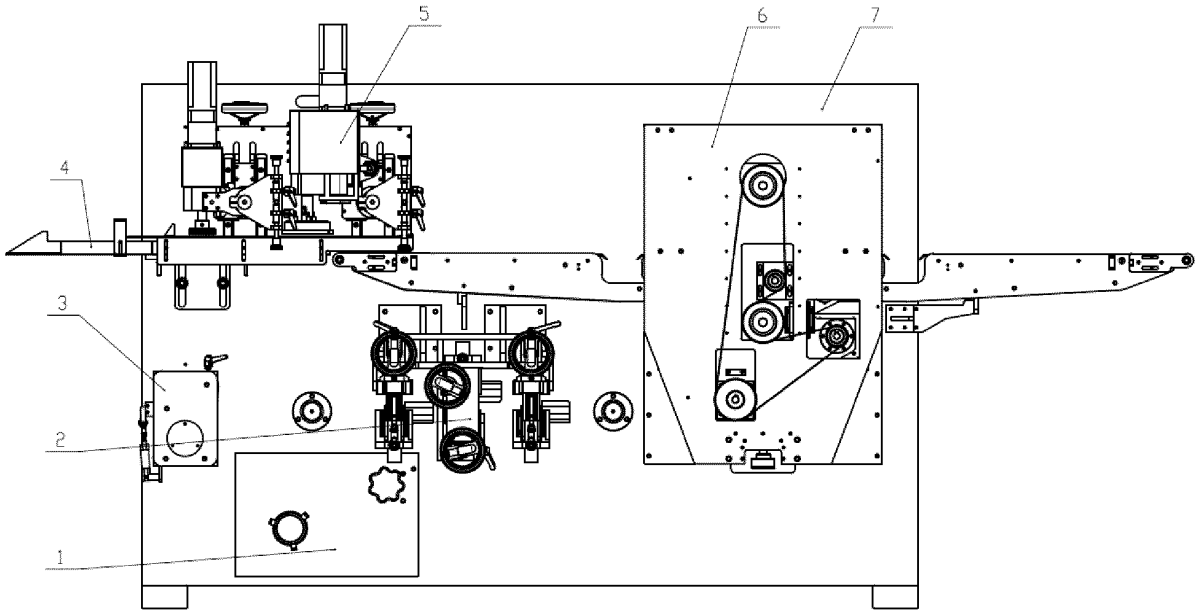

Fig. 1

Description

Technical Field

[0001] The present invention relates to an automatic stand-up pouch forming and packaging machine and belongs to the field of packaging machinery.

Background

[0002] At present, domestic food enterprises use finished stand-up package pouches which have been manufactured completely, the packaging of this type of packages is completed through manual material filling and sealing, in this process, a series of problems, such as materials are pressed by a sealer, seals are infirm and not neat, and so on will be caused, so that the packaging material and labor costs are increased while the production efficiency and degree of automation are relatively low, and related requirements of national food safety production are not met.

Summary

[0003] An object of the present invention is to provide an automatic stand-up pouch forming and packaging machine to solve the problems of a packaging process in the prior art that the materials are pressed by the sealer, the seals are infirm and not neat, the production efficiency and degree of automation are relatively low, the packaging material and labor costs are high, and potential food safety hazards are present.

[0004] A technical solution of the present invention is as follows: an automatic stand-up pouch forming and packaging machine is characterized in comprising a box body, and a pouch film fixing assembly, a crease forming assembly, a pouch film driving assembly, a pouch making assembly, a longitudinal sealing assembly and a transverse sealing assembly, wherein the pouch film fixing assembly, the crease forming assembly, the pouch film driving assembly, the pouch making assembly, the longitudinal sealing assembly and the transverse sealing assembly are mounted in the box body; the crease forming assembly is arranged between the pouch film fixing assembly and the pouch film driving assembly, and the pouch film fixing assembly is used for fixing a pouch film; the crease forming assembly is used for creasing the pouch film; the pouch film driving assembly is used for drawing the pouch film fixed on the pouch film fixing assembly so as to crease the pouch film with the crease forming assembly; the longitudinal sealing assembly is used for sealing longitudinal edges of the pouch film; the transverse sealing assembly is used for sealing transverse edges of the pouch film; and the pouch making assembly is used for filling the pouch film with content materials.

[0005] The automatic stand-up pouch forming and packaging machine provided by the present invention has the beneficial effects that the forming of stand-up pouches and the packaging of material are performed synchronously, so that the appearance of packages is improved, meanwhile, the production efficiency is increased, the cost of the packages is reduced, and the human labor is also reduced.

Brief Description of the Drawings

[0006]

Fig. 1 is an overall structural schematic diagram of an automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 2 is a three-dimensional structural schematic diagram of one side of a pouch film fixing assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 3 is a three-dimensional structural schematic diagram of the other side of the pouch film fixing assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 4 is a three-dimensional structural schematic diagram of a crease forming assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 5 is a partial three-dimensional structural schematic diagram (without a fixed seat in the Fig. 4) of a crease forming assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 6 is a three-dimensional structural schematic diagram of the crease forming assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 7 is a structural schematic diagram of a pouch film driving assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 8 is a structural schematic diagram of a pouch making assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 9 is a structural schematic diagram of a longitudinal sealing assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 10 is a partial structural schematic diagram of the longitudinal sealing assembly of an automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 11 is a structural schematic diagram of a transverse sealing assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

Fig. 12 is a partial structural schematic diagram of the transverse sealing assembly of the automatic stand-up pouch forming and packaging machine of

the present invention.

Fig. 13 is a partial structural schematic diagram of the transverse sealing assembly of the automatic stand-up pouch forming and packaging machine of the present invention.

[0007] Reference signs: pouch film fixing assembly 1; crease forming assembly 2; pouch film driving assembly 3; pouch making assembly 4; longitudinal sealing assembly 5; transverse sealing assembly 6; box body 7; pouch film rotating mechanism 8; pouch film fixing seat 9; pouch film locking mechanism 10; braking mechanism 11; pouch film regulating mechanism 12; rotating roller 13; rotating bearing 14; rotating handwheel 15; forward-reverse screw rod 16; movable locking block 17; locating locking block 18; brake sleeve 19; brake band 20; brake tension spring 21; brake band fixing seat 22; regulating handwheel 23; regulating screw rod 24; regulating threaded block 25; fixed base 26; first indentation opening/closing mechanism 27; first indentation heating block 28; first indentation forming wheel 29; first indentation size regulating mechanism 30; second indentation opening/closing mechanism 31; second indentation heating block 32; second indentation forming wheel 33; second indentation size regulating mechanism 34; third indentation opening/closing mechanism 35; third indentation heating block 36; third indentation forming wheel 37; third indentation size regulating mechanism 38; first indentation opening/closing fixed seat 39; first indentation opening/closing cylinder 40; first indentation opening/closing movable seat 41; first indentation opening/closing guide rail 42; first indentation opening/closing slide block 43; first indentation regulating handwheel 44; first indentation regulating indicator 45; first indentation regulating screw rod 46; first indentation right-handed threaded block 47; first indentation left-handed threaded block 48; first indentation regulating slide block 49; first indentation regulating guide rail 50; second indentation opening/closing fixed seat 51; second indentation opening/closing cylinder 52; second indentation opening/closing movable seat 53; second indentation opening/closing guide rail 54; second indentation opening/closing slide block 55; second indentation regulating handwheel 56; second indentation regulating indicator 57; second indentation regulating screw rod 58; second indentation right-handed threaded block 59; second indentation left-handed threaded block 60; second indentation regulating slide block 61; second indentation regulating guide rail 62; third indentation opening/closing fixed seat 63; third indentation opening/closing cylinder 64; third indentation opening/closing movable seat 65; third indentation opening/closing guide rail 66; third indentation opening/closing slide block 67; third indentation regulating handwheel 68; third indentation regulating indicator 69; third indentation regulating screw rod 70; third indentation right-handed threaded block 71; third indentation left-handed threaded block 72; third indentation regulating slide block 73; third indentation regulating guide rail 74; pouch film driving fixed seat 75; pouch film driving roller 76; pouch film compaction mechanism 77; pouch film driving motor 78; compaction roller 79; compaction connecting plate 80; compaction cylinder 81; pouch maker fixing rod 82; pouch maker bottom plate 83; pouch maker left side plate 84; pouch maker right side plate 85; longitudinal sealing fixed seat 86; traction lift regulating mechanism 87; traction angle regulating mechanism 88; traction opening/closing mechanism 89; traction transmission mechanism 90; traction driving motor 91; traction wheel 92; longitudinal sealing lift regulating mechanism 93; longitudinal sealing angle regulating mechanism 94; longitudinal sealing opening/closing mechanism 95; longitudinal sealing transmission mechanism 96; longitudinal sealing driving motor 97; longitudinal sealing heating disc 98; longitudinal sealing wheel 99; traction lift handwheel 100; traction lift screw rod 101; traction lift threaded block 102; traction lift guide rail 103; traction lift slide block 104; traction lift fixed plate 105; traction rotating rod 106; traction angle connecting plate 107; traction angle regulating lower knockout-pin 108; traction angle regulating upper knockout-pin 109; traction opening/closing sliding seat 110; traction opening/closing slide block 111; traction opening/closing guide rail 112; traction opening/closing cylinder 113; traction opening/closing fixed seat 114; traction driving shaft 115; traction driving gear 116; traction driven gear 117; traction driven shaft 118; longitudinal sealing lift handwheel 119; longitudinal sealing lift screw rod 120; longitudinal sealing lift threaded block 121; longitudinal sealing lift guide rail 122; longitudinal sealing lift slide block 123; longitudinal sealing lift fixed plate 124; longitudinal sealing rotating rod 125; longitudinal sealing angle connecting plate 126; longitudinal sealing angle regulating lower knockout-pin 127; longitudinal sealing angle regulating upper knockout-pin 128; longitudinal sealing opening/closing fixed seat 129; longitudinal sealing opening/closing cylinder 130; longitudinal sealing opening/closing gear rack 131; longitudinal sealing opening/closing gear 132; longitudinal sealing opening/closing base 133; driving sun gear 134; driven sun gear 135; driving planetary gear 136; driven planetary gear 137; longitudinal sealing driving transmission shaft 138; longitudinal sealing driven transmission shaft 139; longitudinal sealing driving shaft 140; transverse sealing fixed seat 141; transverse-sealing sealing cutoff mechanism 142; input belt 143; output belt 144; transverse sealing driving motor 145; transverse sealing lift regulating mechanism 146; pin mechanism 147; delivery driving motor 148; transverse sealing transmission mechanism 149; delivery transmission mechanism 150; upper sealer fixed seat 151; upper sealer 152; lower sealer 153; lower sealer fixed seat 154; sealing guide rail 155; sealing slide bearing 156; connecting plate 157; sealing rocker arm 158; sealing rocker arm fixed sleeve 159; transverse sealing lift handwheel 160; transverse sealing lift driving belt pulley 161; transverse sealing lift belt 162; transverse sealing lift driven belt pulley 163; transverse sealing lift screw rod 164; transverse sealing

lift threaded insert 165; transverse sealing lift fixed wallboard 166; pin fixed seat 167; pin cylinder 168; pin plugboard 169; guide post 170; transverse sealing driving belt pulley 171; transverse sealing tensioning belt pulley 172; transverse sealing lower sealing driving belt pulley 173; transverse sealing upper sealing driving belt pulley 174; transverse sealing transition belt pulley 175; transverse sealing driving belt 176; delivery driving belt pulley 177; lower clamped delivery transmission shaft 178; delivery tensioning belt pulley 179; output transmission belt pulley 180; output transmission shaft 181; guide bearing 182; synchronizing belt 183; traction cylinder mounting plate 184; input belt driving roller 185; output belt driving roller 186; longitudinal sealing angle fixed shaft 187; and traction angle fixed shaft 188.

Detailed Description

[0008] Refer to Fig. 1, an automatic stand-up pouch forming and packaging machine of the present invention is characterized in comprising a box body 7, a pouch film fixing assembly 1 is mounted at the lower side of the internal front of the box body 7, a crease forming assembly 2 and a pouch film driving assembly 3 are mounted above the pouch film fixing assembly 1, and the crease forming assembly 2 is arranged behind the pouch film driving assembly 3; a pouch making assembly 4 and a longitudinal sealing assembly 5 are mounted at the top of the internal front of the box body 7; a transverse sealing assembly 6 is mounted at the internal rear part of the box body 7; and the pouch film fixing assembly 1 is used for fixing a pouch film, the crease forming assembly 2 is used for creasing the pouch film, the pouch film driving assembly 3 is used for drawing the pouch film fixed on the pouch film fixing assembly 1 so as to crease the pouch film with the crease forming assembly 2, the longitudinal sealing assembly 5 is used for sealing longitudinal edges of the pouch film, the transverse sealing assembly 6 is used for sealing transverse edges of the pouch film, and the pouch making assembly 4 is used for filling the pouch film with content materials.

[0009] Refer to Fig. 2 and Fig. 3, the pouch film fixing assembly 1 comprises a pouch film rotating mechanism 8, a pouch film fixing seat 9, a pouch film locking mechanism 10, a braking mechanism 11 and a pouch film regulating mechanism 12, the pouch film rotating mechanism 8 comprises a rotating roller 13 and a rotating bearing 14, and one end of the rotating roller 13 penetrates through a corresponding hole of the pouch film fixing seat 9 and is rotatably connected into the corresponding hole of the pouch film fixing seat 9 through the rotating bearing 14; the pouch film locking mechanism 10 comprises a rotating handwheel 15, a forward-reverse screw rod 16, a movable locking block 17 and a locating locking block 18, two long holes are formed in the tube wall of the rotating roller 13 along the axial direction, and the movable locking block 17 and the locating locking block 18 are arranged in the rotating roller 13 and are provided with protruding ends extending out of the long holes; the tail end of the forward-reverse screw rod 16 rotatably penetrates into the hole of the rotating roller 13, right-handed and left-handed thread portions of the forward-reverse screw rod 16 are threadedly engaged with the movable locking block 17 and the locating locking block 18, respectively, and the head end of the forward-reverse screw rod 16 is connected with the rotating handwheel 15; the pouch film regulating mechanism 12 comprises a regulating handwheel 23, a regulating screw rod 24, a regulating threaded block 25, a connecting plate 157, two guide posts 170 and guide bearings 182, one end of each of the two guide posts 170 is fixed to the pouch film fixing seat 9, the connecting plate 157 is slidably mounted on the guide posts 170 through the guide bearings 182, the tail end of the pouch film rotating mechanism 8 rotatably penetrates through the connecting plate 157, and the braking mechanism 11 is mounted on the tail end of the pouch film rotating mechanism 8; the head end of the regulating screw rod 24 is connected with the regulating handwheel 23, and the tail end of the regulating screw rod 24 rotatably penetrates through the pouch film fixing seat 9 and screws through the regulating threaded block 25 mounted on the connecting plate 157; and the braking mechanism 11 comprises a brake sleeve 19, a brake band 20, a brake tension spring 21 and a brake band fixing seat 22, the brake sleeve 19 is mounted at the tail end of the pouch film rotating mechanism 8, the brake band fixing seat 22 is fixed on the connecting plate 157, and the brake band 20 encircles the brake sleeve 19, is connected with the brake tension spring 21 and then is fixed to the brake band fixing seat 22. A pouch film for packaging is put on the rotating roller 13, the rotating handwheel 15 is rotated to make the movable locking block 17 and the locating locking block 18 clamp the pouch film, and the fixed pouch film can be moved back and forth along the rotating roller 13 by rotating the regulating handwheel 23.

[0010] Refer to Fig. 4 to Fig. 6, the crease forming assembly 2 comprises a crease forming fixed base 26, first indentation opening/closing mechanisms 27, first indentation heating blocks 28, first indentation forming wheels 29, a first indentation size regulating mechanism 30, second indentation opening/closing mechanisms 31, second indentation heating blocks 32, second indentation forming wheels 33, a second indentation size regulating mechanism 34, third indentation opening/closing mechanisms 35, third indentation heating blocks 36, third indentation forming wheels 37 and a third indentation size regulating mechanism 38, the first indentation size regulating mechanism 30, the second indentation size regulating mechanism 34 and the third indentation size regulating mechanism 38 are fixed on the crease forming fixed base 26, the first indentation opening/closing mechanisms 27 are fixed on the first indentation size regulating mechanism 30, the second indentation opening/closing mechanisms 31 are fixed on the second indentation size regulating mechanism 34, the third indentation open-

ing/closing mechanisms 35 are fixed on the third indentation size regulating mechanism 38, the first indentation heating mechanisms 28 and the first indentation forming wheels 29 are fixed on the first indentation opening/closing mechanisms 27, the second indentation heating mechanisms 32 and the second indentation forming wheels 33 are fixed on the second indentation opening/closing mechanisms 31, and the third indentation heating mechanisms 36 and the third indentation forming wheels 37 are fixed on the third indentation opening/closing mechanisms 35.

[0011] The first indentation opening/closing mechanisms 27 comprise two sets of first indentation opening/closing fixed seats 39, first indentation opening/closing cylinders 40, first indentation opening/closing movable seats 41, first indentation opening/closing guide rails 42 and first indentation opening/closing slide blocks 43, which are arranged in bilateral symmetry, the first indentation opening/closing fixed seats 39 are slidably connected to the underside of the fixed base 26 and are connected with the first indentation size regulating mechanism 30, cylinder bodies of the first indentation opening/closing cylinders 40 and the first indentation opening/closing guide rails 42 are fixed below the first indentation opening/closing fixed seats 39, the first indentation opening/closing movable seats 41 slidably sleeve the first indentation opening/closing guide rails 42, one end of the first indentation opening/closing movable seat 41 is connected with one end of a connecting plate 271, and the first indentation opening/closing slide block 43 is arranged between the connecting plate 271 and the first indentation opening/closing guide rail 42; and the first indentation heating blocks 28 and the first indentation forming wheels 29 are mounted at the other end of the connecting plate 271.

[0012] The first indentation size regulating mechanism 30 comprises a first indentation regulating handwheel 44, a first indentation regulating indicator 45, a first indentation regulating screw rod 46, a first indentation right-handed threaded block 47, a first indentation left-handed threaded block 48, first indentation regulating slide blocks 49 and a first indentation regulating guide rail 50, the first indentation regulating screw rod 46 is provided with right-handed and left-handed threads and is rotatably supported by the fixed base 26, and the right-handed and left-handed thread sections of the first indentation regulating screw rod 46 are connected with the first indentation opening/closing fixed seats 39 through the first indentation right-handed threaded block 47 and the first indentation left-handed threaded block 48 which are threadedly connected with the first indentation regulating screw rod 46, respectively; the first indentation regulating handwheel 44 and the first indentation regulating indicator 45 are mounted at one end of the first indentation regulating screw rod 46; and the first indentation regulating guide rail 50 is connected below the fixed base 26 and is in sliding connection with the first indentation opening/closing fixed seats 39 through the first indentation regulating slide blocks 49.

[0013] The second indentation opening/closing mechanisms 31 comprise second indentation opening/closing fixed seats 51, second indentation opening/closing cylinders 52, second indentation opening/closing movable seats 53, second indentation opening/closing guide rails 54 and second indentation opening/closing slide blocks 55; and the relationship of connection of all components of the second indentation opening/closing mechanisms 31 is the same as that of the first indentation opening/closing mechanisms 27, and the second indentation opening/closing mechanisms 31 and the first indentation opening/closing mechanisms 27 are opposite in the up-down direction.

[0014] The second indentation size regulating mechanism 34 comprises a second indentation regulating handwheel 56, a second indentation regulating indicator 57, a second indentation regulating screw rod 58, a second indentation right-handed threaded block 59, a second indentation left-handed threaded block 60, second indentation regulating slide blocks 61 and a second indentation regulating guide rail 62; and the second indentation size regulating mechanism 34 and the first indentation size regulating mechanism 30 are the same in relationship of connection and are opposite the up-down direction.

[0015] The third indentation opening/closing mechanisms 35 comprise third indentation opening/closing fixed seats 63, third indentation opening/closing cylinders 64, third indentation opening/closing movable seats 65, third indentation opening/closing guide rails 66 and third indentation opening/closing slide blocks 67; and the relationship of connection of all components of the third indentation opening/closing mechanisms 35 is the same as that of the first indentation opening/closing mechanisms 27.

[0016] The third indentation size regulating mechanism 38 comprises a third indentation regulating handwheel 68, a third indentation regulating indicator 69, a third indentation regulating screw rod 70, a third indentation right-handed threaded block 71, a third indentation left-handed threaded block 72, third indentation regulating slide blocks 73 and a third indentation regulating guide rail 74; and the third indentation size regulating mechanism 38 and the first indentation size regulating mechanism 30 are the same in relationship of connection.

[0017] The first indentation opening/closing mechanisms 27 and the matched first indentation size regulating mechanism 30 thereof and the third indentation opening/closing mechanisms 35 and the matched third indentation size regulating mechanism 38 thereof are symmetrically arranged at the two sides of the second indentation opening/closing mechanisms 31 and the second indentation size regulating mechanism 34.

[0018] The operating principle of the crease forming assembly 2 is as follows: the pouch film successively passes through the space between the first indentation

forming wheels 29, the space between the second indentation forming wheels 33 and the space between the third indentation forming wheels 37, and when the equipment starts up, the first indentation opening/closing mechanisms 27, the second indentation opening/closing mechanisms 31 and the third indentation opening/closing mechanisms 35 are closed separately, indentations required for forming a stand-up pouch will be made on the pouch film through the action of the three groups of indentation heating blocks and the action of the three groups of indentation forming wheels, and the distance between the three groups of indentations can be separately changed through regulating the three indentation size regulating mechanisms so as to meet the requirements of stand-up pouch forming.

[0019] Refer to Fig. 7, the pouch film driving assembly 3 comprises a pouch film driving fixed seat 75, a pouch film driving roller 76, a pouch film compaction mechanism 77 and a pouch film driving motor 78, the pouch film compaction mechanism 77 comprises a compaction roller 79, a compaction connecting plate 80 and a compaction cylinder 81, the two ends of the pouch film driving roller 76 and the two ends of the U-shaped compaction connecting plate 80 are rotatably connected between two end plates of the pouch film driving fixed seat 75, and one end of the pouch film driving roller 76 is connected with an output shaft of the pouch film driving motor 78 mounted at one end of the pouch film driving fixed seat 75; and the two ends of the compaction roller 79 are rotatably connected between the two ends of the U-shaped compaction connecting plate 80, the two ends of the compaction cylinder 81 are connected between the middle part of the pouch film driving fixed seat 75 and the middle part of the compaction connecting plate 80, and the compaction roller 79 and the pouch film driving roller 76 can be mutually compacted through driving the compaction connecting plate 80 to be deflected by the compaction cylinder 81.

[0020] The operating principle of the pouch film driving assembly 3 is as follows: when the equipment starts up, the pouch film compaction mechanism 77 enables the compaction roller 79 to compact the pouch film wound on the pouch film driving roller 76, and the pouch film driving motor 78 drives the pouch film driving roller 76 to rotate so as to draw the pouch film wound on the pouch film driving roller 76 to move forwards.

[0021] Refer to Fig. 8, the pouch making assembly 4 comprises pouch maker fixing rods 82, a pouch maker bottom plate 83, a pouch maker left side plate 84 and a pouch maker right side plate 85, the pouch maker bottom plate 83 is fixed on the pouch maker fixing rods 82, and the pouch maker left side plate 84 and the pouch maker right side plate 85 are fixed at the left and right sides of the pouch maker bottom plate 83, respectively.

[0022] The operating principle of the pouch making assembly 4 is as follows: the two sides of the pouch film are laminated and folded and then pass through a gap between the pouch maker left side plate 84 and the pouch maker right side plate 85 , the pouch film fits closely to internal walls of the pouch maker bottom plate 83, the pouch maker left side plate 84 and the pouch maker right side plate 85, and when the equipment works, material to be packaged will enter the pouch film fitting to the internal wall of the pouch maker bottom plate 83 from the left side of the pouch maker bottom plate 83.

[0023] Refer to Fig. 9 and Fig. 10, the longitudinal sealing assembly 5 comprises a longitudinal sealing fixed seat 86, a traction lift regulating mechanism 87, a traction angle regulating mechanism 88, a traction opening/closing mechanism 89, a traction transmission mechanism 90, a traction driving motor 91, traction wheels 92, a longitudinal sealing lift regulating mechanism 93, a longitudinal sealing angle regulating mechanism 94, a longitudinal sealing opening/closing mechanism 95, a longitudinal sealing transmission mechanism 96, a longitudinal sealing driving motor 97, longitudinal sealing heating discs 98 and longitudinal sealing wheels 99, the traction lift regulating mechanism 87 and the longitudinal sealing lift regulating mechanism 93 are fixed on the longitudinal sealing fixed seat 86, the traction angle regulating mechanism 88 is fixed on the traction lift regulating mechanism 87, the traction opening/closing mechanism 89 is fixed on the traction angle regulating mechanism 88, the traction transmission mechanism 90 and the traction driving motor 91 are fixed on the traction opening/closing mechanism 89, the traction transmission mechanism 90 is connected with the traction driving motor 91, the traction wheels 92 are fixed on the traction transmission mechanism 90, the longitudinal sealing angle regulating mechanism 94 is fixed on the longitudinal sealing lift regulating mechanism 93, the longitudinal sealing opening/closing mechanism 95 is fixed on the longitudinal sealing angle regulating mechanism 94, the longitudinal sealing transmission mechanism 96 and the longitudinal sealing driving motor 97 are fixed on the longitudinal sealing opening/closing mechanism 95, the longitudinal sealing transmission mechanism 96 is connected with the longitudinal sealing driving motor 97, the longitudinal sealing wheels 99 are fixed on the longitudinal sealing opening/closing mechanism 95, and the longitudinal sealing heating mechanisms 98 are fixed on the longitudinal sealing wheels 99.

[0024] The traction lift regulating mechanism 87 comprises a traction lift handwheel 100, a traction lift screw rod 101, a traction lift threaded block 102, traction lift guide rails 103, a traction lift slide block 104 and a traction lift fixed plate 105; the traction angle regulating mechanism 88 comprises a traction rotating rod 106, a traction angle connecting plate 107, a traction angle regulating lower knockout-pin 108 and a traction angle regulating upper knockout-pin 109, the traction lift screw rod 101 is rotatably connected to the longitudinal sealing fixed seat 86, and the upper and lower ends of the traction lift screw rod 101 are connected with the traction lift handwheel 100 and the traction lift threaded block 102, respectively; and the two traction lift guide rails 103 are longitudinally fixed at one side of the longitudinal sealing fixed seat 86,

the traction lift slide block 104 is slidably connected to the traction lift guide rails 103, and the traction lift fixed plate 105 is connected to the traction lift slide block 104.

[0025] The traction opening/closing mechanism 89 comprises a traction opening/closing sliding seat 110, a traction opening/closing slide block 111, a traction opening/closing guide rail 112, a traction opening/closing cylinder 113 and a traction opening/closing fixed seat 114, the traction opening/closing sliding seat 110, the traction opening/closing slide block 111, the traction opening/closing guide rail 112, the traction opening/closing cylinder 113 and the traction opening/closing fixed seat 114; the traction opening/closing guide rail 112 is mounted on the traction rotating rod 106, the traction opening/closing slide block 111 is slidably mounted on the traction opening/closing guide rail 112, the traction opening/closing sliding seat 110 is connected to the traction opening/closing slide block 111 and is connected with a piston rod of the traction opening/closing cylinder 113, and a cylinder body of the traction opening/closing cylinder 113 is connected with the traction rotating rod 106 through a traction cylinder mounting plate 184; and the traction opening/closing fixed seat 114 is arranged next to the traction opening/closing sliding seat 110 and is mounted on the traction rotating rod 106.

[0026] The traction transmission mechanism 90 comprises a traction driving shaft 115, a traction driving gear 116, a traction driven gear 117 and a traction driven shaft 118, the two ends of the traction driving shaft 115 are connected with an output shaft of the traction driving motor 91 and the traction driving gear 116, respectively, and the traction driven gear 117 is mounted on the traction opening/closing sliding seat 110 and is engaged with the traction driving gear 116; and the traction driving gear 116 is mounted on the traction driven shaft 118, and the traction wheels 92 are mounted at the lower end of the traction driven shaft 118.

[0027] The longitudinal sealing lift regulating mechanism 93 comprises a longitudinal sealing lift handwheel 119, a longitudinal sealing lift screw rod 120, a longitudinal sealing lift threaded block 121, longitudinal sealing lift guide rails 122, a longitudinal sealing lift slide block 123 and a longitudinal sealing lift fixed plate 124, and the relationship of connection among the components of the longitudinal sealing lift regulating mechanism 93 is the same as that of the traction lift regulating mechanism 87.

[0028] The longitudinal sealing angle regulating mechanism 94 comprises a longitudinal sealing rotating rod 125, a longitudinal sealing angle connecting plate 126, a longitudinal sealing angle regulating lower knockout-pin 127, a longitudinal sealing angle regulating upper knockout-pin 128 and a longitudinal sealing angle fixed shaft 187, the two ends of the longitudinal sealing angle fixed shaft 187 are rotatably connected between the longitudinal sealing lift fixed plate 124 and the longitudinal sealing angle connecting plate 126, the longitudinal sealing rotating rod 125 sleeves the longitudinal sealing angle fixed shaft 187, and the longitudinal sealing angle regulating upper knockout-pin 128 and the longitudinal sealing angle regulating lower knockout-pin 127 are oppositely mounted at the upper and lower parts of one side, far away from the longitudinal sealing rotating rod 125, of the longitudinal sealing angle connecting plate 126, respectively; and the longitudinal sealing angle regulating upper knockout-pin 128 and the longitudinal sealing angle regulating lower knockout-pin 127 are separately screwed into screw holes of nut blocks which are arranged at one side of the longitudinal sealing angle connecting plate 126, adjusting knobs are separately mounted at the top end of the longitudinal sealing angle regulating upper knockout-pin 128 and the bottom end of the longitudinal sealing angle regulating lower knockout-pin 127, the bottom end of the longitudinal sealing angle regulating upper knockout-pin 128 and the top end of the longitudinal sealing angle regulating lower knockout-pin 127 abut against a circular column arranged on the longitudinal sealing rotating rod 125, and the longitudinal sealing rotating rod 125 can be rotated through simultaneously rotating the longitudinal sealing angle regulating upper knockout-pin 128 and the longitudinal sealing angle regulating lower knockout-pin 127.

[0029] The longitudinal sealing opening/closing mechanism 95 comprises a longitudinal sealing opening/closing fixed seat 129, a longitudinal sealing opening/closing cylinder 130, a longitudinal sealing opening/closing gear rack 131, a longitudinal sealing opening/closing gear 132 and a longitudinal sealing opening/closing base 133, the longitudinal sealing opening/closing fixed seat 129 is connected to the longitudinal sealing rotating rod 125, a cylinder body of the longitudinal sealing opening/closing cylinder 130 is fixed on the longitudinal sealing opening/closing fixed seat 129, a piston rod of the longitudinal sealing opening/closing cylinder 130 is connected with the longitudinal sealing opening/closing gear rack 131, and the longitudinal sealing opening/closing gear 132 is arranged at one end of the longitudinal sealing opening/closing base 133 and is engaged with the longitudinal sealing opening/closing gear rack 131; and the other end of the longitudinal sealing opening/closing base 133 is rotatably connected to a longitudinal sealing driving transmission shaft 138 of the longitudinal sealing transmission mechanism 96.

[0030] The longitudinal sealing transmission mechanism 96 comprises a driving sun gear 134, a driven sun gear 135, a driving planetary gear 136, a driven planetary gear 137, the longitudinal sealing driving transmission shaft 138, a longitudinal sealing driven transmission shaft 139 and a longitudinal sealing driving shaft 140, the driving sun gear 134 is connected with an output shaft of the longitudinal sealing driving motor 97 through the longitudinal sealing driving shaft 140 and is engaged with the driving planetary gear 136 mounted on the longitudinal sealing driving transmission shaft 138; a shaft of the driven sun gear 135 is rotatably connected to the longitudinal sealing opening/closing fixed seat 129 and is engaged with the driven planetary gear 137; the driven planetary

gear 137 is mounted on the longitudinal sealing driven transmission shaft 139; and the longitudinal sealing wheels 99 are mounted at the bottom end of the longitudinal sealing driven transmission shaft 139.

[0031] The operating principle of the longitudinal sealing assembly 5 is as follows: the two sides of the pouch film are laminated and folded and then successively pass through the space between the two traction wheels 92 and the space between the two longitudinal sealing wheels 99, and when the equipment works, the traction opening/closing mechanism 89 and the longitudinal sealing opening/closing mechanism 95 respectively enable the two traction wheels and the two longitudinal sealing wheels to compact the pass-by pouch film, the traction driving motor 91 enables the two traction wheels 92 to clamp the pouch film to move forwards through the traction transmission mechanism 90, the longitudinal sealing driving motor 97 enables the two longitudinal sealing wheels 99 to clamp the pouch film to move forwards through the longitudinal sealing transmission mechanism 96, the longitudinal sealing heating discs 98 are used for hot-sealing the pouch film that passes through the space between the longitudinal sealing wheels, and heights and angles required by the traction wheels 92 and the longitudinal sealing wheels 99 during the operation are regulated by the traction lift regulating mechanism 87, the traction angle regulating mechanism 88, the longitudinal sealing lift regulating mechanism 93 and the longitudinal sealing angle regulating mechanism 94.

[0032] Refer to Fig. 11 to Fig. 13, the transverse sealing assembly 6 comprises a transverse sealing fixed seat 141, a transverse-sealing sealing cutoff mechanism 142, an input belt 143, an output belt 144, a transverse sealing driving motor 145, a transverse sealing lift regulating mechanism 146, four pin mechanisms 147, a delivery driving motor 148, a transverse sealing transmission mechanism 149 and a delivery transmission mechanism 150, the input belt 143, the output belt 144, the transverse sealing driving motor 145, the transverse sealing lift regulating mechanism 146 and the delivery driving motor 148 are fixed on the transverse sealing fixed seat 141, the transverse-sealing sealing cutoff mechanism 142 is fixed on the transverse sealing lift regulating mechanism 146, the transverse sealing driving motor 145 drives the transverse-sealing sealing cutoff mechanism 142 to rotate through the transverse sealing transmission mechanism 149, the delivery driving motor 148 drives the input belt mechanism 143 and the output belt mechanism 144 to rotate through the delivery transmission mechanism 150, and the four pin mechanisms 147 are fixed on the transverse sealing fixed seat 141 and are arranged at the two sides of the transverse-sealing sealing cutoff mechanism 142; and an input end of the input belt 143 corresponds to an output end of the pouch making assembly 4.

[0033] The transverse sealing lift regulating mechanism 146 comprises a transverse sealing lift handwheel 160, a transverse sealing lift driving belt pulley 161, a transverse sealing lift belt 162, a transverse sealing lift driven belt pulley 163, a transverse sealing lift screw rod 164, a transverse sealing lift threaded insert 165 and a transverse sealing lift fixed wallboard 166, the transverse sealing lift screw rod 164 vertically and rotatably penetrates through a bottom plate, the top end of the transverse sealing lift screw rod 164 is connected with the bottom surface of the U-shaped transverse sealing lift fixed wallboard 166 through the transverse sealing lift threaded insert 165, the transverse sealing lift driven belt pulley 163 is mounted at the bottom end of the transverse sealing lift screw rod 164, a shaft lever of the transverse sealing lift handwheel 160 is rotatably mounted at one end of the bottom plate, and the transverse sealing lift driving belt pulley 161 is mounted on the shaft lever and is in transmission connection with the transverse sealing lift driven belt pulley 163 through the transverse sealing lift belt 162.

[0034] The transverse-sealing sealing cutoff mechanism 142 comprises an upper sealer fixed seat 151, an upper sealer 152, a lower sealer 153, a lower sealer fixed seat 154, sealing guide rails 155, sealing slide bearings 156, sealing rocker arms 158 and sealing rocker arm fixed sleeves 159, the two sealing guide rails 155 are vertically connected to the bottom surface of the transverse sealing lift fixed wallboard 166, and both the upper sealer fixed seat 151 and the lower sealer fixed seat 154 are slidably connected to the sealing guide rails 155 through the sealing slide bearings 156; the upper sealer 152 is connected to the underside of the upper sealer fixed seat 151, and the lower sealer 153 is connected to the upside of the lower sealer fixed seat 154; and each of the two ends of each of the upper sealer fixed seat 151 and the lower sealer fixed seat 154 is connected with one of two vertical faces of the transverse sealing lift fixed wallboard 166 through one sealing rocker arm 158 and one sealing rocker arm fixed sleeve 159.

[0035] The pin mechanisms 147 comprise pin fixed seats 167, pin cylinders 168 and pin plugboards 169, the pin fixed seats 167 are fixed on the transverse sealing fixed seat 141, and the pin cylinders 168 are fixed on the pin fixed seats 167 and drive the pin plugboards 169 to telescope.

[0036] The transverse sealing transmission mechanism 149 comprises a transverse sealing driving belt pulley 171, a transverse sealing tensioning belt pulley 172, a transverse sealing lower sealing driving belt pulley 173, a transverse sealing upper sealing driving belt pulley 174, a transverse sealing transition belt pulley 175 and a transverse sealing driving belt 176; and the delivery transmission mechanism 150 comprises a delivery driving belt pulley 177, a lower clamped delivery transmission shaft 178, a delivery tensioning belt pulley 179, an output transmission belt pulley 180 and an output transmission shaft 181.

[0037] One end of the corresponding sealing rocker arm 158 of one end of the upper sealer fixed seat 151 rotatably penetrates through the corresponding sealing

rocker arm fixed sleeve 159, and the transverse sealing upper sealing driving belt pulley 174 is mounted at the end of the corresponding sealing rocker arm 158; the transverse sealing driving motor 145 and the delivery driving motor 148 are separately mounted at the two sides below the transverse sealing upper sealing driving belt pulley 174, and the transverse sealing driving belt pulley 171 and the delivery driving belt pulley 177 are mounted on an output shaft of the transverse sealing driving motor 145 and an output shaft of the delivery driving motor 148, respectively; the output transmission shaft 181 is rotatably mounted below the transverse sealing upper sealing driving belt pulley 174, the output transmission belt pulley 180 is mounted on the output transmission shaft 181, the other end of the output transmission shaft 181 is connected with an output belt driving roller 186, and the output belt driving roller 186 drives the output belt 144 to rotate; a synchronizing belt 183 is connected between the delivery driving belt pulley 177 and the output transmission belt pulley 180, and the delivery tensioning belt pulley 179 is mounted on the synchronizing belt 183; and the top end of the output shaft of the delivery driving motor 148 is coaxially connected with the lower clamped delivery transmission shaft 178, the other end of the lower clamped delivery transmission shaft 178 is connected with an input belt driving roller 185, and the input belt driving roller 185 drives the input belt 143 to rotate.

[0038] The transverse sealing tensioning belt pulley 172 is mounted between and below the transverse sealing driving belt pulley 171 and the delivery driving belt pulley 177, the transverse sealing lower sealing driving belt pulley 173 is mounted above the transverse sealing tensioning belt pulley 172, the transverse sealing transition belt pulley 175 is mounted above the transverse sealing lower sealing driving belt pulley 173, and the transverse sealing driving belt 176 clockwise bypasses the transverse sealing tensioning belt pulley 172, the transverse sealing driving belt pulley 171, the transverse sealing lower sealing driving belt pulley 173, the transverse sealing transition belt pulley 175 and the transverse sealing upper sealing driving belt pulley 174 successively.

[0039] The input belt 143 carries the pouch film that wraps the content materials to move towards the direction of the transverse-sealing sealing cutoff mechanism 142, the transverse-sealing sealing cutoff mechanism 142 carries out cutoff among the content materials and carries out hot-sealing on pouch films at the two sides of each cutoff port, before the pouch film is cut off by the transverse-sealing sealing cutoff mechanism 142, the four pin cylinders 168 simultaneously drive the four pin plugboards 169 to stretch out and insert to creases formed by the second indentation forming wheels 33, thus, the pouch film is inwards folded along the creases formed by the second indentation forming wheels 33, and the output belt 144 carries and outputs packaged content materials.

[0040] When the automatic stand-up pouch forming and packaging machine works, the pouch film driving assembly 3 draws the pouch film fixed on the pouch film fixing assembly 1 to pass through the crease forming assembly 2, then, creases required for forming the stand-up pouch can be formed in the pouch film, the size of the creases can be regulated through the first indentation size regulating mechanism 17, the second indentation size regulating mechanism 21 and the third indentation size regulating mechanism 25, the longitudinal sealing assembly 5 can draw the pouch film output from the pouch film driving assembly 3 to pass through the pouch making assembly 4, the content materials can enter the pouch film by the pouch making assembly 4, longitudinal edges of the pouch film can be sealed by the longitudinal sealing assembly 5, and transverse edges of the pouch film can be sealed by the transverse sealing assembly 6.

Claims

1. An automatic stand-up pouch forming and packaging machine, **characterized in** comprising a box body 7, wherein a pouch film fixing assembly 1 is mounted at the lower side of the internal front of the box body 7, a crease forming assembly 2 and a pouch film driving assembly 3 are mounted above the pouch film fixing assembly 1, and the crease forming assembly 2 is arranged behind the pouch film driving assembly 3; a pouch making assembly 4 and a longitudinal sealing assembly 5 are mounted at the top of the internal front of the box body 7; a transverse sealing assembly 6 is mounted at the internal rear part of the box body 7; and the pouch film fixing assembly 1 is used for fixing a pouch film, the crease forming assembly 2 is used for creasing the pouch film, the pouch film driving assembly 3 is used for drawing the pouch film fixed on the pouch film fixing assembly 1 so as to crease the pouch film with the crease forming assembly 2, the longitudinal sealing assembly 5 is used for sealing longitudinal edges of the pouch film, the transverse sealing assembly 6 is used for sealing transverse edges of the pouch film, and the pouch making assembly 4 is used for filling the pouch film with content materials.

2. The automatic stand-up pouch forming and packaging machine according to claim 1, **characterized in that** the pouch film fixing assembly 1 comprises a pouch film rotating mechanism 8, a pouch film fixing seat 9, a pouch film locking mechanism 10, a braking mechanism 11 and a pouch film regulating mechanism 12, wherein the pouch film rotating mechanism 8 comprises a rotating roller 13 and a rotating bearing 14, and one end of the rotating roller 13 penetrates through a corresponding hole of the pouch film fixing seat 9 and is rotatably connected into the corresponding hole of the pouch film fixing seat 9 through the rotating bearing 14; the pouch film locking mech-

anism 10 comprises a rotating handwheel 15, a forward-reverse screw rod 16, a movable locking block 17 and a locating locking block 18, two long holes are formed in the tube wall of the rotating roller 13 along the axial direction, and the movable locking block 17 and the locating locking block 18 are arranged in the rotating roller 13 and are provided with protruding ends extending out of the long holes; the tail end of the forward-reverse screw rod 16 rotatably penetrates into a hole of the rotating roller 13, right-handed and left-handed thread portions of the forward-reverse screw rod 16 are threadedly engaged with the movable locking block 17 and the locating locking block 18, respectively, and the head end of the forward-reverse screw rod 16 is connected with the rotating handwheel 15; the pouch film regulating mechanism 12 comprises a regulating handwheel 23, a regulating screw rod 24, a regulating threaded block 25, a connecting plate 157, two guide posts 170 and guide bearings 182, one end of each of the two guide posts 170 is fixed to the pouch film fixing seat 9, the connecting plate 157 is slidably mounted on the guide posts 170 through the guide bearings 182, the tail end of the pouch film rotating mechanism 8 rotatably penetrates through the connecting plate 157, and the braking mechanism 11 is mounted on the tail end of the pouch film rotating mechanism 8; the head end of the regulating screw rod 24 is connected with the regulating handwheel 23, and the tail end of the regulating screw rod 24 rotatably penetrates through the pouch film fixing seat 9 and screws through the regulating threaded block 25 mounted on the connecting plate 157; and the braking mechanism 11 comprises a brake sleeve 19, a brake band 20, a brake tension spring 21 and a brake band fixing seat 22, the brake sleeve 19 is mounted at the tail end of the pouch film rotating mechanism 8, the brake band fixing seat 22 is fixed on the connecting plate 157, and the brake band 20 encircles the brake sleeve 19, is connected with the brake tension spring 21 and then is fixed to the brake band fixing seat 22.

3. The automatic stand-up pouch forming and packaging machine according to claim 1, **characterized in that** the crease forming assembly 2 comprises a crease forming fixed base 26, first indentation opening/closing mechanisms 27, first indentation heating blocks 28, a first indentation forming wheels 29, a first indentation size regulating mechanism 30, second indentation opening/closing mechanisms 31, second indentation heating blocks 32, second indentation forming wheels 33, a second indentation size regulating mechanism 34, third indentation opening/closing mechanisms 35, third indentation heating blocks 36, third indentation forming wheels 37 and a third indentation size regulating mechanism 38, wherein the first indentation size regulating mechanism 30, the second indentation size regulating mechanism 34 and the third indentation size regulating mechanism 38 are fixed on the crease forming fixed base 26, the first indentation opening/closing mechanisms 27 are fixed on the first indentation size regulating mechanism 30, the second indentation opening/closing mechanisms 31 are fixed on the second indentation size regulating mechanism 34, the third indentation opening/closing mechanisms 35 are fixed on the third indentation size regulating mechanism 38, the first indentation heating mechanisms 28 and the first indentation forming wheels 29 are fixed on the first indentation opening/closing mechanisms 27, the second indentation heating mechanisms 32 and the second indentation forming wheels 33 are fixed on the second indentation opening/closing mechanisms 31, and the third indentation heating mechanisms 36 and the third indentation forming wheels 37 are fixed on the third indentation opening/closing mechanisms 35.

4. The automatic stand-up pouch forming and packaging machine according to claim 3, **characterized in that** the first indentation opening/closing mechanisms 27 comprise two sets of first indentation opening/closing fixed seats 39, first indentation opening/closing cylinders 40, first indentation opening/closing movable seats 41, first indentation opening/closing guide rails 42 and first indentation opening/closing slide blocks 43, which are arranged in bilateral symmetry, wherein the first indentation opening/closing fixed seats 39 are slidably connected to the underside of the fixed base 26 and are connected with the first indentation size regulating mechanism 30, cylinder bodies of the first indentation opening/closing cylinders 40 and the first indentation opening/closing guide rails 42 are fixed below the first indentation opening/closing fixed seats 39, the first indentation opening/closing movable seats 41 slidably sleeve the first indentation opening/closing guide rails 42, one end of the first indentation opening/closing movable seat 41 is connected with one end of a connecting plate 271, and the first indentation opening/closing slide block 43 is arranged between the connecting plate 271 and the first indentation opening/closing guide rail 42; and the first indentation heating block 28 and the first indentation forming wheel 29 are mounted at the other end of the connecting plate 271;
the first indentation size regulating mechanism 30 comprises a first indentation regulating handwheel 44, a first indentation regulating indicator 45, a first indentation regulating screw rod 46, a first indentation right-handed threaded block 47, a first indentation left-handed threaded block 48, first indentation regulating slide blocks 49 and a first indentation regulating guide rail 50, wherein the first indentation regulating screw rod 46 is provided with right-handed

and left-handed threads and is rotatably supported by the fixed base 26, and the right-handed and left-handed thread sections of the first indentation regulating screw rod 46 are connected with the first indentation opening/closing fixed seats 39 through the first indentation right-handed threaded block 47 and the first indentation left-handed threaded block 48 which are threadedly connected with the first indentation regulating screw rod 46, respectively; the first indentation regulating handwheel 44 and the first indentation regulating indicator 45 are mounted at one end of the first indentation regulating screw rod 46; and the first indentation regulating guide rail 50 is connected below the fixed base 26 and is in sliding connection with the first indentation opening/closing fixed seats 39 through the first indentation regulating slide blocks 49;

the second indentation opening/closing mechanisms 31 comprise second indentation opening/closing fixed seats 51, second indentation opening/closing cylinders 52, second indentation opening/closing movable seats 53, second indentation opening/closing guide rails 54 and second indentation opening/closing slide blocks 55; and the relationship of connection of all components of the second indentation opening/closing mechanisms 31 is the same as that of the first indentation opening/closing mechanisms 27, and the second indentation opening/closing mechanisms 31 and the first indentation opening/closing mechanisms 27 are opposite in the up-down direction;

the second indentation size regulating mechanism 34 comprises a second indentation regulating handwheel 56, a second indentation regulating indicator 57, a second indentation regulating screw rod 58, a second indentation right-handed threaded block 59, a second indentation left-handed threaded block 60, second indentation regulating slide blocks 61 and a second indentation regulating guide rail 62; and the second indentation size regulating mechanism 34 and the first indentation size regulating mechanism 30 are the same in relationship of connection and are opposite in the up-down direction;

the third indentation opening/closing mechanisms 35 comprise third indentation opening/closing fixed seats 63, third indentation opening/closing cylinders 64, third indentation opening/closing movable seats 65, third indentation opening/closing guide rails 66 and third indentation opening/closing slide blocks 67; and the relationship of connection of all components of the third indentation opening/closing mechanisms 35 is the same as that of the first indentation opening/closing mechanisms 27;

the third indentation size regulating mechanism 38 comprises a third indentation regulating handwheel 68, a third indentation regulating indicator 69, a third indentation regulating screw rod 70, a third indentation right-handed threaded block 71, a third indentation left-handed threaded block 72, third indentation regulating slide blocks 73 and a third indentation regulating guide rail 74; and the third indentation size regulating mechanism 38 and the first indentation size regulating mechanism 30 are the same in relationship of connection;

and the first indentation opening/closing mechanisms 27 and the matched first indentation size regulating mechanism 30 thereof and the third indentation opening/closing mechanisms 35 and the matched third indentation size regulating mechanism 38 thereof are symmetrically arranged at the two sides of the second indentation opening/closing mechanisms 31 and the second indentation size regulating mechanism 34.

5. The automatic stand-up pouch forming and packaging machine according to claim 1, **characterized in that** the pouch film driving assembly 3 comprises a pouch film driving fixed seat 75, a pouch film driving roller 76, a pouch film compaction mechanism 77 and a pouch film driving motor 78, wherein the pouch film compaction mechanism 77 comprises a compaction roller 79, a compaction connecting plate 80 and a compaction cylinder 81, the two ends of the pouch film driving roller 76 and the two ends of the U-shaped compaction connecting plate 80 are rotatably connected between two end plates of the pouch film driving fixed seat 75, and one end of the pouch film driving roller 76 is connected with an output shaft of the pouch film driving motor 78 mounted at one end of the pouch film driving fixed seat 75; and the two ends of the compaction roller 79 are rotatably connected between the two ends of the U-shaped compaction connecting plate 80, the two ends of the compaction cylinder 81 are connected between the middle part of the pouch film driving fixed seat 75 and the middle part of the compaction connecting plate 80, and the compaction roller 79 and the pouch film driving roller 76 can be mutually compacted through driving the compaction connecting plate 80 to be deflected by the compaction cylinder 81.

6. The automatic stand-up pouch forming and packaging machine according to claim 1, **characterized in that** the pouch making assembly 4 comprises pouch maker fixing rods 82, a pouch maker bottom plate 83, a pouch maker left side plate 84 and a pouch maker right side plate 85, wherein the pouch maker bottom plate 83 is fixed on the pouch maker fixing rods 82, and the pouch maker left side plate 84 and the pouch maker right side plate 85 are fixed at the left and right sides of the pouch maker bottom plate 83, respectively.

7. The automatic stand-up pouch forming and packaging machine according to claim 6, **characterized in that** the longitudinal sealing assembly 5 comprises

a longitudinal sealing fixed seat 86, a traction lift regulating mechanism 87, a traction angle regulating mechanism 88, a traction opening/closing mechanism 89, a traction transmission mechanism 90, a traction driving motor 91, traction wheels 92, a longitudinal sealing lift regulating mechanism 93, a longitudinal sealing angle regulating mechanism 94, a longitudinal sealing opening/closing mechanism 95, a longitudinal sealing transmission mechanism 96, a longitudinal sealing driving motor 97, longitudinal sealing heating discs 98 and longitudinal sealing wheels 99, wherein the traction lift regulating mechanism 87 and the longitudinal sealing lift regulating mechanism 93 are fixed on the longitudinal sealing fixed seat 86, the traction angle regulating mechanism 88 is fixed on the traction lift regulating mechanism 87, the traction opening/closing mechanism 89 is fixed on the traction angle regulating mechanism 88, the traction transmission mechanism 90 and the traction driving motor 91 are fixed on the traction opening/closing mechanism 89, the traction transmission mechanism 90 is connected with the traction driving motor 91, the traction wheels 92 are fixed on the traction transmission mechanism 90, the longitudinal sealing angle regulating mechanism 94 is fixed on the longitudinal sealing lift regulating mechanism 93, the longitudinal sealing opening/closing mechanism 95 is fixed on the longitudinal sealing angle regulating mechanism 94, the longitudinal sealing transmission mechanism 96 and the longitudinal sealing driving motor 97 are fixed on the longitudinal sealing opening/closing mechanism 95, the longitudinal sealing transmission mechanism 96 is connected with the longitudinal sealing driving motor 97, the longitudinal sealing wheels 99 are fixed on the longitudinal sealing opening/closing mechanism 95, and the longitudinal sealing heating mechanisms 98 are fixed on the longitudinal sealing wheels 99.

8. The automatic stand-up pouch forming and packaging machine according to claim 7, **characterized in that** the traction lift regulating mechanism 87 comprises a traction lift handwheel 100, a traction lift screw rod 101, a traction lift threaded block 102, traction lift guide rails 103, a traction lift slide block 104 and a traction lift fixed plate 105; the traction angle regulating mechanism 88 comprises a traction rotating rod 106, a traction angle connecting plate 107, a traction angle regulating lower knockout-pin 108 and a traction angle regulating upper knockout-pin 109, wherein the traction lift screw rod 101 is rotatably connected to the longitudinal sealing fixed seat 86, and the upper and lower ends of the traction lift screw rod 101 are connected with the traction lift handwheel 100 and the traction lift threaded block 102, respectively; and the two traction lift guide rails 103 are longitudinally fixed at one side of the longitudinal sealing fixed seat 86, the traction lift slide block 104 is slidably connected to the traction lift guide rails 103, and the traction lift fixed plate 105 is connected to the traction lift slide block 104;

the traction opening/closing mechanism 89 comprises a traction opening/closing sliding seat 110, a traction opening/closing slide block 111, a traction opening/closing guide rail 112, a traction opening/closing cylinder 113, a traction opening/closing fixed seat 114 and a traction cylinder mounting plate 184, the traction opening/closing sliding seat 110, the traction opening/closing slide block 111, the traction opening/closing guide rail 112, the traction opening/closing cylinder 113 and the traction opening/closing fixed seat 114; the traction opening/closing guide rail 112 is mounted on the traction rotating rod 106, the traction opening/closing slide block 111 is slidably mounted on the traction opening/closing guide rail 112, the traction opening/closing sliding seat 110 is connected to the traction opening/closing slide block 111 and is connected with a piston rod of the traction opening/closing cylinder 113, and a cylinder body of the traction opening/closing cylinder 113 is connected with the traction rotating rod 106 through the traction cylinder mounting plate 184; and the traction opening/closing fixed seat 114 is arranged next to the traction opening/closing sliding seat 110 and is mounted on the traction rotating rod 106;

the traction transmission mechanism 90 comprises a traction driving shaft 115, a traction driving gear 116, a traction driven gear 117 and a traction driven shaft 118, wherein the two ends of the traction driving shaft 115 are connected with an output shaft of the traction driving motor 91 and the traction driving gear 116, respectively, and the traction driven gear 117 is mounted on the traction opening/closing sliding seat 110 and is engaged with the traction driving gear 116; and the traction driving gear 116 is mounted on the traction driven shaft 118, and the traction wheels 92 are mounted at the lower end of the traction driven shaft 118;

the longitudinal sealing lift regulating mechanism 93 comprises a longitudinal sealing lift handwheel 119, a longitudinal sealing lift screw rod 120, a longitudinal sealing lift threaded block 121, longitudinal sealing lift guide rails 122, a longitudinal sealing lift slide block 123 and a longitudinal sealing lift fixed plate 124, and the relationship of connection among the components of the longitudinal sealing lift regulating mechanism 93 is the same as that of the traction lift regulating mechanism 87;

the longitudinal sealing angle regulating mechanism 94 comprises a longitudinal sealing rotating rod 125, a longitudinal sealing angle connecting plate 126, a longitudinal sealing angle regulating lower knockout-pin 127, a longitudinal sealing angle regulating upper knockout-pin 128 and a longitudinal sealing angle fixed shaft 187, wherein the two ends of the longitu-

dinal sealing angle fixed shaft 187 are rotatably connected between the longitudinal sealing lift fixed plate 124 and the longitudinal sealing angle connecting plate 126, the longitudinal sealing rotating rod 125 sleeves the longitudinal sealing angle fixed shaft 187, and the longitudinal sealing angle regulating upper knockout-pin 128 and the longitudinal sealing angle regulating lower knockout-pin 127 are oppositely mounted at the upper and lower parts of one side, far away from the longitudinal sealing rotating rod 125, of the longitudinal sealing angle connecting plate 126, respectively; and the longitudinal sealing angle regulating upper knockout-pin 128 and the longitudinal sealing angle regulating lower knockout-pin 127 are separately screwed into screw holes of nut blocks which are arranged at one side of the longitudinal sealing angle connecting plate 126, adjusting knobs are separately mounted at the top end of the longitudinal sealing angle regulating upper knockout-pin 128 and the bottom end of the longitudinal sealing angle regulating lower knockout-pin 127, the bottom end of the longitudinal sealing angle regulating upper knockout-pin 128 and the top end of the longitudinal sealing angle regulating lower knockout-pin 127 abut against a circular column arranged on the longitudinal sealing rotating rod 125, and the longitudinal sealing rotating rod 125 can be rotated through simultaneously rotating the longitudinal sealing angle regulating upper knockout-pin 128 and the longitudinal sealing angle regulating lower knockout-pin 127;

the longitudinal sealing opening/closing mechanism 95 comprises a longitudinal sealing opening/closing fixed seat 129, a longitudinal sealing opening/closing cylinder 130, a longitudinal sealing opening/closing gear rack 131, a longitudinal sealing opening/closing gear 132 and a longitudinal sealing opening/closing base 133, wherein the longitudinal sealing opening/closing fixed seat 129 is connected to the longitudinal sealing rotating rod 125, a cylinder body of the longitudinal sealing opening/closing cylinder 130 is fixed on the longitudinal sealing opening/closing fixed seat 129, a piston rod of the longitudinal sealing opening/closing cylinder 130 is connected with the longitudinal sealing opening/closing gear rack 131, and the longitudinal sealing opening/closing gear 132 is arranged at one end of the longitudinal sealing opening/closing base 133 and is engaged with the longitudinal sealing opening/closing gear rack 131; and the other end of the longitudinal sealing opening/closing base 133 is rotatably connected to a longitudinal sealing driving transmission shaft 138 of the longitudinal sealing transmission mechanism 96; and the longitudinal sealing transmission mechanism 96 comprises a driving sun gear 134, a driven sun gear 135, a driving planetary gear 136, a driven planetary gear 137, the longitudinal sealing driving transmission shaft 138, a longitudinal sealing driven transmission shaft 139 and a longitudinal sealing driving shaft 140, wherein the driving sun gear 134 is connected with an output shaft of the longitudinal sealing driving motor 97 through the longitudinal sealing driving shaft 140 and is engaged with the driving planetary gear 136 mounted on the longitudinal sealing driving transmission shaft 138; a shaft of the driven sun gear 135 is rotatably connected to the longitudinal sealing opening/closing fixed seat 129 and is engaged with the driven planetary gear 137; the driven planetary gear 137 is mounted on the longitudinal sealing driven transmission shaft 139; and the longitudinal sealing wheels 99 are mounted at the bottom end of the longitudinal sealing driven transmission shaft 139.

9. The automatic stand-up pouch forming and packaging machine according to claim 8, **characterized in that** the transverse sealing assembly 6 comprises a transverse sealing fixed seat 141, a transverse-sealing sealing cutoff mechanism 142, an input belt 143, an output belt 144, a transverse sealing driving motor 145, a transverse sealing lift regulating mechanism 146, four pin mechanisms 147, a delivery driving motor 148, a transverse sealing transmission mechanism 149 and a delivery transmission mechanism 150, wherein the input belt 143, the output belt 144, the transverse sealing driving motor 145, the transverse sealing lift regulating mechanism 146 and the delivery driving motor 148 are fixed on the transverse sealing fixed seat 141, the transverse-sealing sealing cutoff mechanism 142 is fixed on the transverse sealing lift regulating mechanism 146, the transverse sealing driving motor 145 drives the transverse-sealing sealing cutoff mechanism 142 to rotate through the transverse sealing transmission mechanism 149, the delivery driving motor 148 drives the input belt mechanism 143 and the output belt mechanism 144 to rotate through the delivery transmission mechanism 150, and the four pin mechanisms 147 are fixed on the transverse sealing fixed seat 141 and are arranged at the two sides of the transverse-sealing sealing cutoff mechanism 142; and an input end of the input belt 143 corresponds to an output end of the pouch making assembly 4.

10. The automatic stand-up pouch forming and packaging machine according to claim 9, **characterized in that** the transverse sealing lift regulating mechanism 146 comprises a transverse sealing lift handwheel 160, a transverse sealing lift driving belt pulley 161, a transverse sealing lift belt 162, a transverse sealing lift driven belt pulley 163, a transverse sealing lift screw rod 164, a transverse sealing lift threaded insert 165 and a transverse sealing lift fixed wallboard 166, wherein the transverse sealing lift screw rod 164 vertically and rotatably penetrates through a bottom plate, the top end of the transverse sealing lift

screw rod 164 is connected with the bottom surface of the U-shaped transverse sealing lift fixed wallboard 166 through the transverse sealing lift threaded insert 165, the transverse sealing lift driven belt pulley 163 is mounted at the bottom end of the transverse sealing lift screw rod 164, a shaft lever of the transverse sealing lift handwheel 160 is rotatably mounted at one end of the bottom plate, and the transverse sealing lift driving belt pulley 161 is mounted on the shaft lever and is in transmission connection with the transverse sealing lift driven belt pulley 163 through the transverse sealing lift belt 162;

the transverse-sealing sealing cutoff mechanism 142 comprises an upper sealer fixed seat 151, an upper sealer 152, a lower sealer 153, a lower sealer fixed seat 154, sealing guide rails 155, sealing slide bearings 156, sealing rocker arms 158 and sealing rocker arm fixed sleeves 159, wherein the two sealing guide rails 155 are vertically connected to the bottom surface of the transverse sealing lift fixed wallboard 166, and both the upper sealer fixed seat 151 and the lower sealer fixed seat 154 are slidably connected to the sealing guide rails 155 through the sealing slide bearings 156; the upper sealer 152 is connected to the underside of the upper sealer fixed seat 151, and the lower sealer 153 is connected to the upside of the lower sealer fixed seat 154; and each of the two ends of each of the upper sealer fixed seat 151 and the lower sealer fixed seat 154 is connected with one of two vertical faces of the transverse sealing lift fixed wallboard 166 through one sealing rocker arm 158 and one sealing rocker arm fixed sleeve 159;

the pin mechanisms 147 comprise pin fixed seats 167, pin cylinders 168 and pin plugboards 169, wherein the pin fixed seats 167 are fixed on the transverse sealing fixed seat 141, and the pin cylinders 168 are fixed on the pin fixed seats 167 and drive the pin plugboards 169 to telescope;

the transverse sealing transmission mechanism 149 comprises a transverse sealing driving belt pulley 171, a transverse sealing tensioning belt pulley 172, a transverse sealing lower sealing driving belt pulley 173, a transverse sealing upper sealing driving belt pulley 174, a transverse sealing transition belt pulley 175 and a transverse sealing driving belt 176; and the delivery transmission mechanism 150 comprises a delivery driving belt pulley 177, a lower clamped delivery transmission shaft 178, a delivery tensioning belt pulley 179, an output transmission belt pulley 180 and an output transmission shaft 181;

one end of the corresponding sealing rocker arm 158 of one end of the upper sealer fixed seat 151 rotatably penetrates through the corresponding sealing rocker arm fixed sleeve 159, and the transverse sealing upper sealing driving belt pulley 174 is mounted at the end of the corresponding sealing rocker arm 158; the transverse sealing driving motor 145 and the delivery driving motor 148 are separately mounted at the two sides below the transverse sealing upper sealing driving belt pulley 174, and the transverse sealing driving belt pulley 171 and the delivery driving belt pulley 177 are mounted on an output shaft of the transverse sealing driving motor 145 and an output shaft of the delivery driving motor 148, respectively; the output transmission shaft 181 is rotatably mounted below the transverse sealing upper sealing driving belt pulley 174, the output transmission belt pulley 180 is mounted on the output transmission shaft 181, the other end of the output transmission shaft 181 is connected with an output belt driving roller 186, and the output belt driving roller 186 drives the output belt 144 to rotate; a synchronizing belt 183 is connected between the delivery driving belt pulley 177 and the output transmission belt pulley 180, and the delivery tensioning belt pulley 179 is mounted on the synchronizing belt 183; the top end of the output shaft of the delivery driving motor 148 is coaxially connected with the lower clamped delivery transmission shaft 178; and the other end of the lower clamped delivery transmission shaft 178 is connected with an input belt driving roller 185, and the input belt driving roller 185 drives the input belt 143 to rotate;

and the transverse sealing tensioning belt pulley 172 is mounted between and below the transverse sealing driving belt pulley 171 and the delivery driving belt pulley 177, the transverse sealing lower sealing driving belt pulley 173 is mounted above the transverse sealing tensioning belt pulley 172, the transverse sealing transition belt pulley 175 is mounted above the transverse sealing lower sealing driving belt pulley 173, and the transverse sealing driving belt 176 clockwise bypasses the transverse sealing tensioning belt pulley 172, the transverse sealing driving belt pulley 171, the transverse sealing lower sealing driving belt pulley 173, the transverse sealing transition belt pulley 175 and the transverse sealing upper sealing driving belt pulley 174 successively.

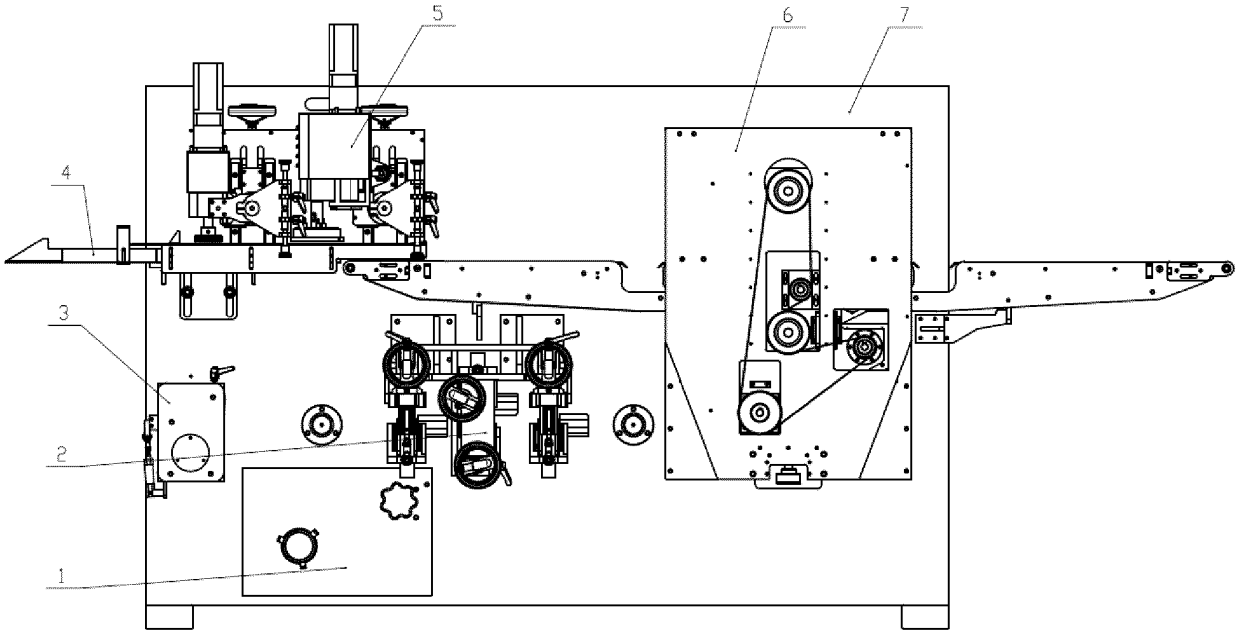

Fig. 1

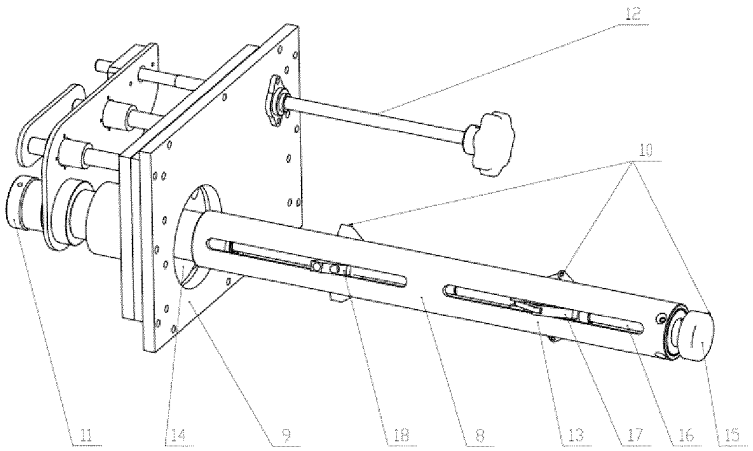

Fig. 2

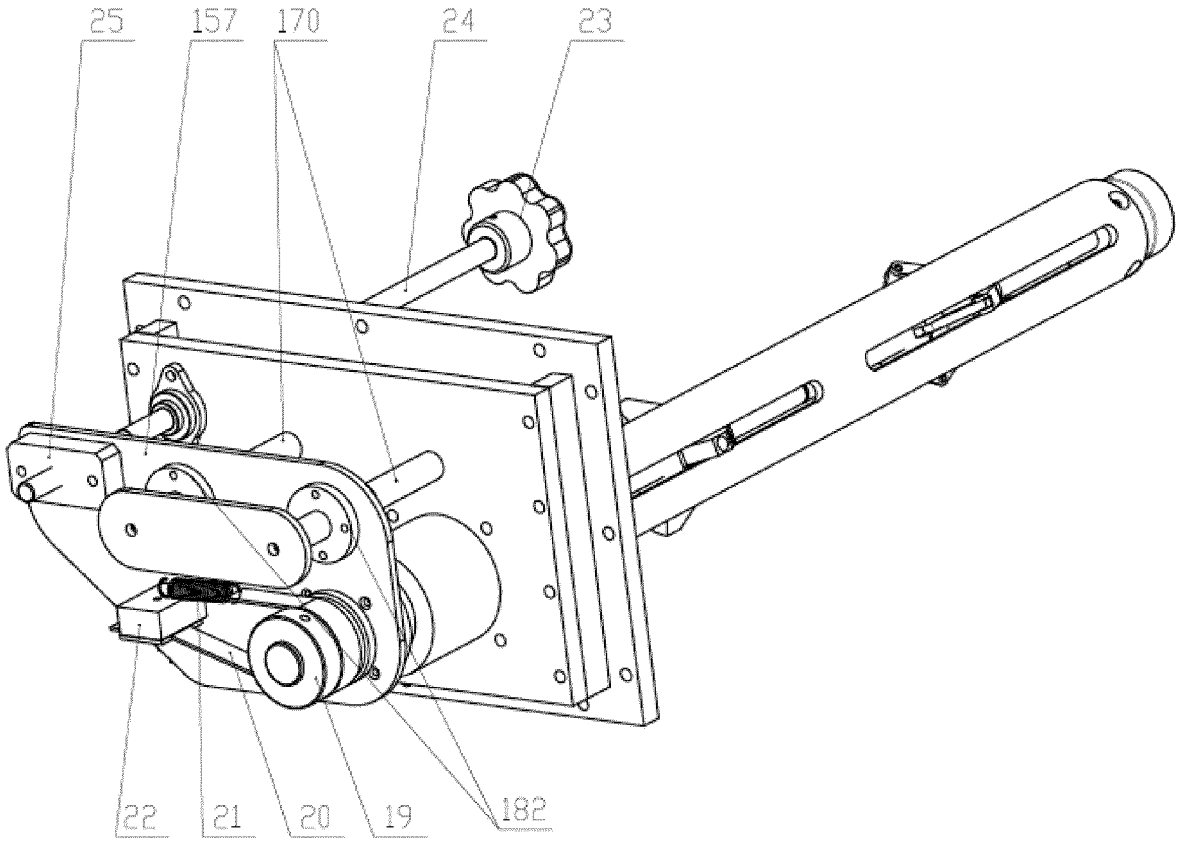

Fig. 3

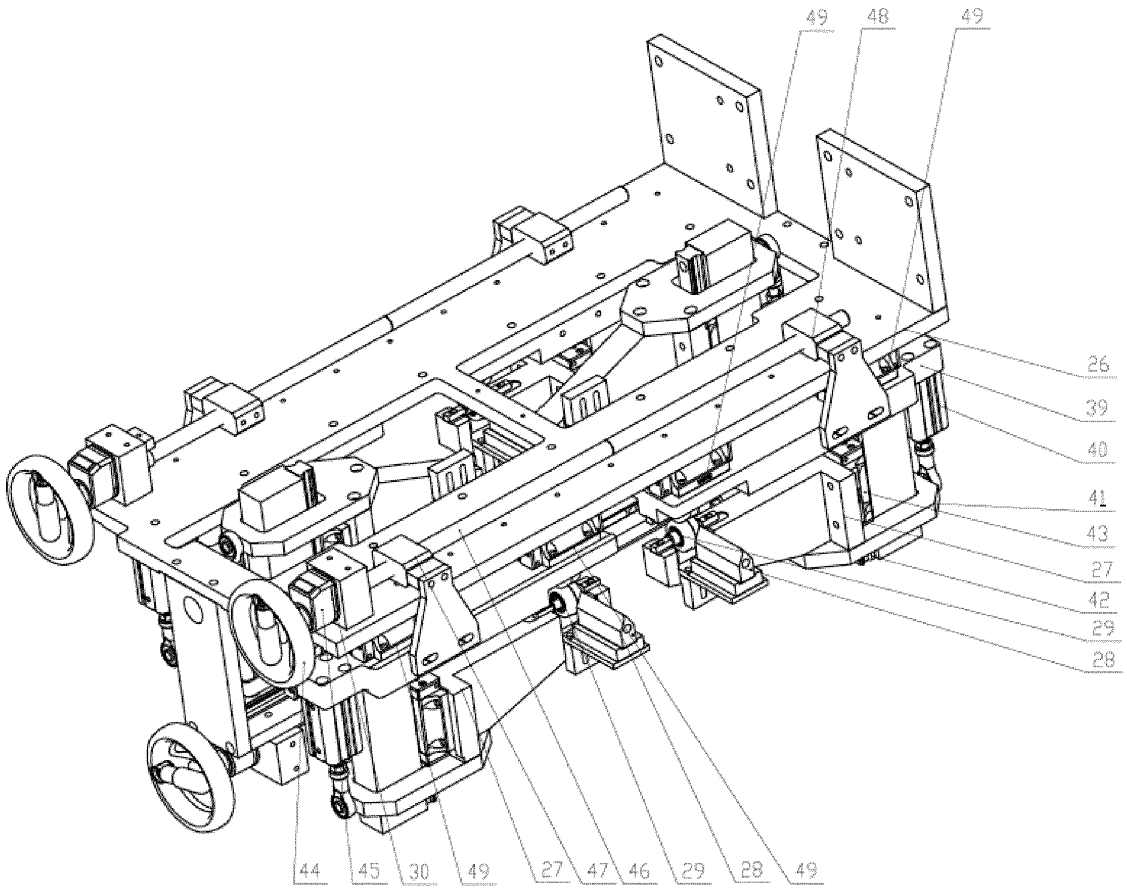
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Fig. 4

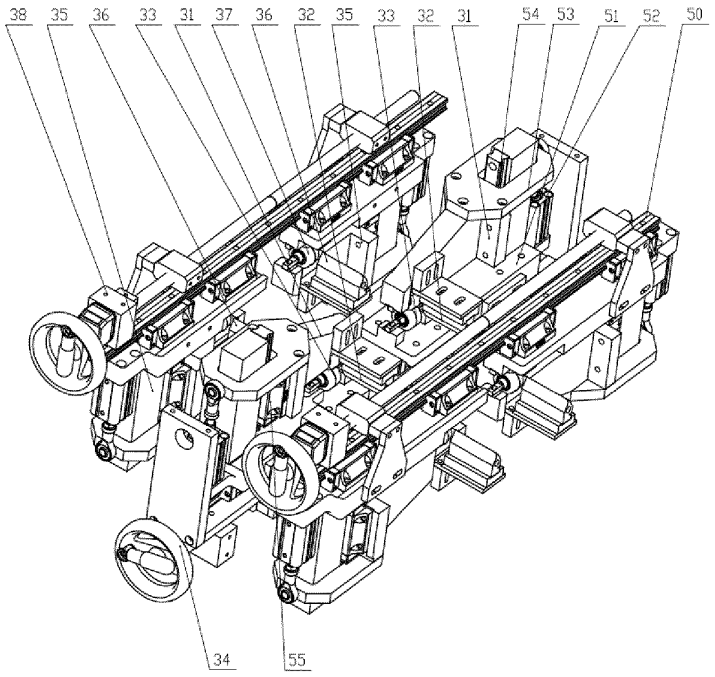
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Fig. 5

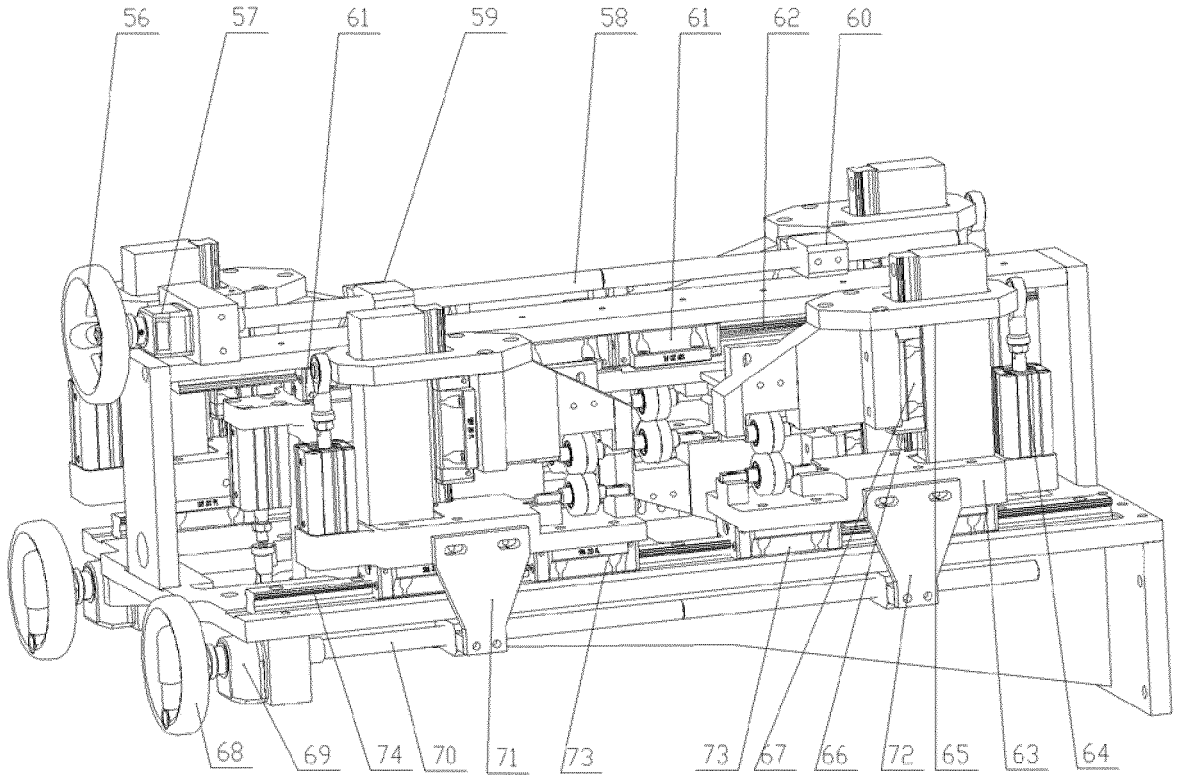
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Fig. 6

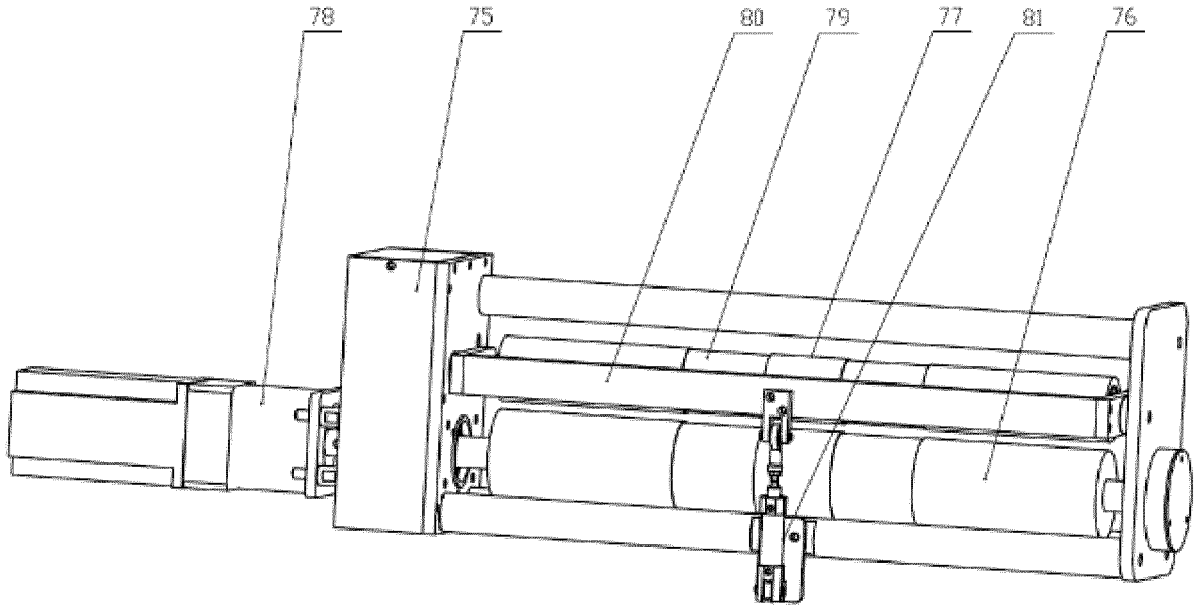
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Fig. 7

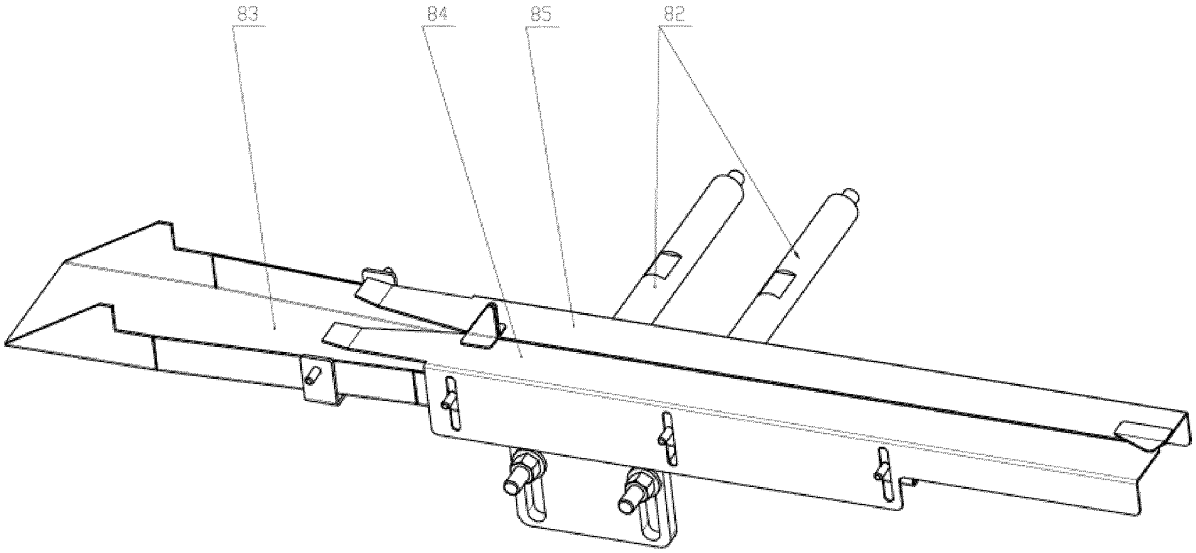
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Fig. 8

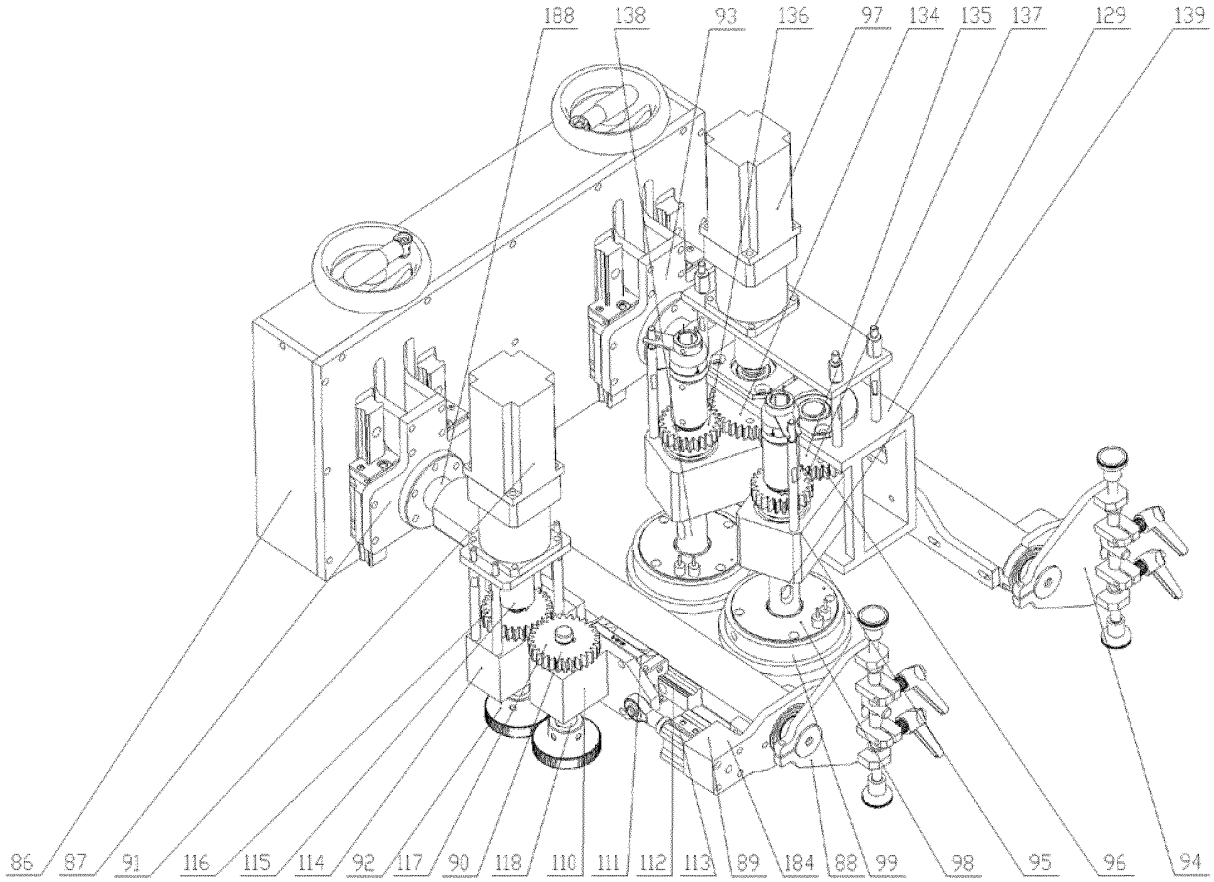
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Fig. 9

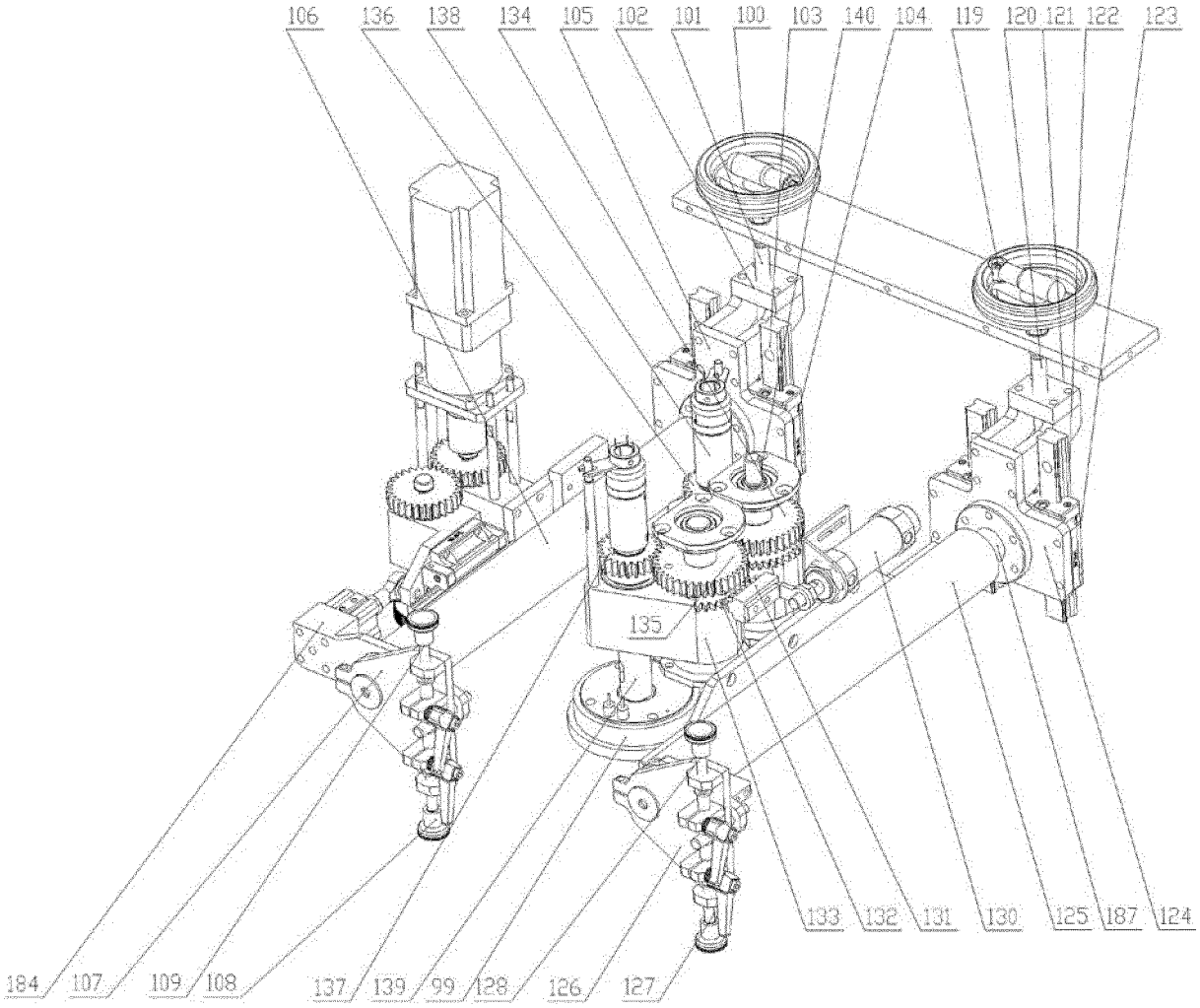
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Fig. 10

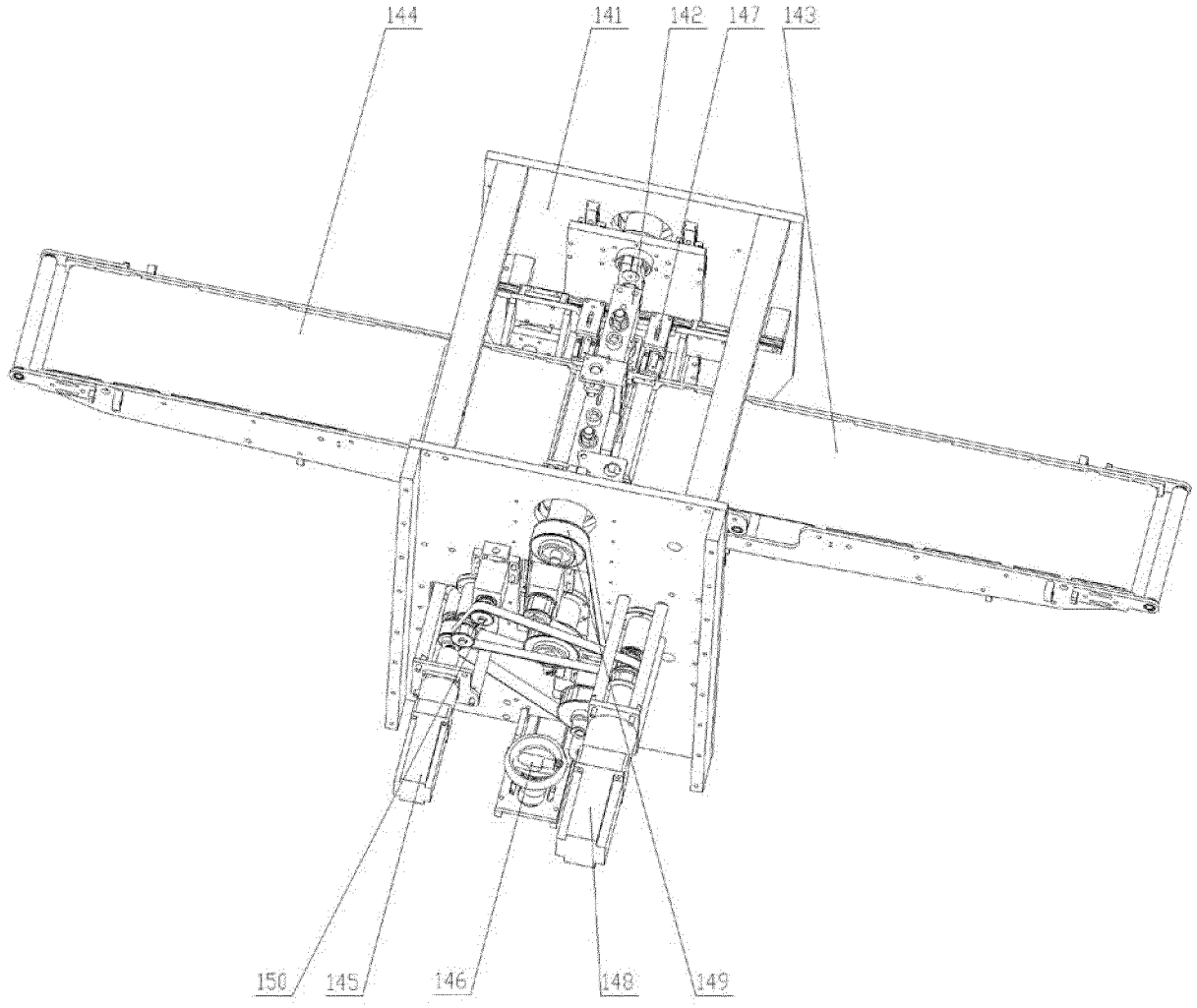

Fig. 11

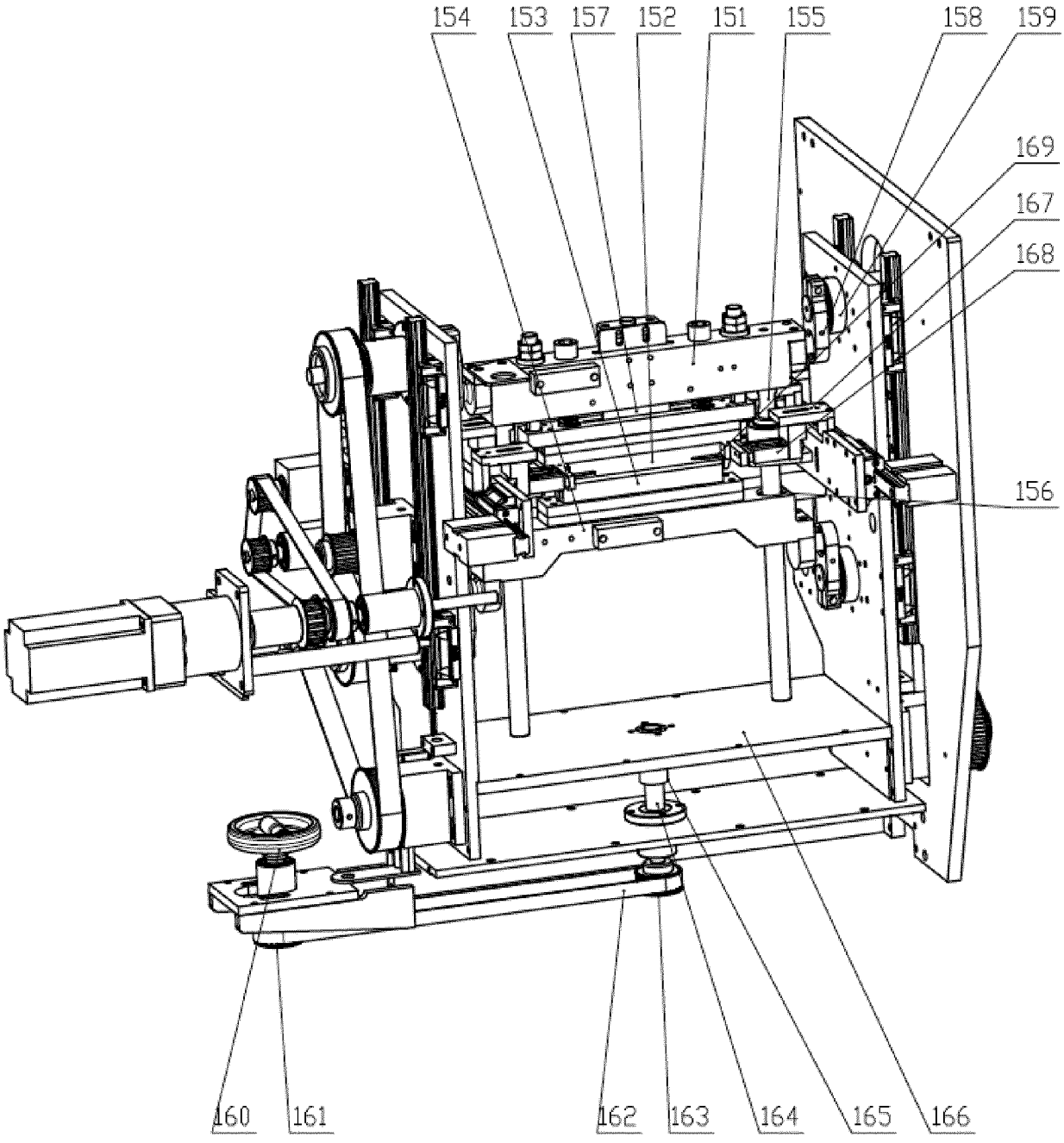
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Fig. 12

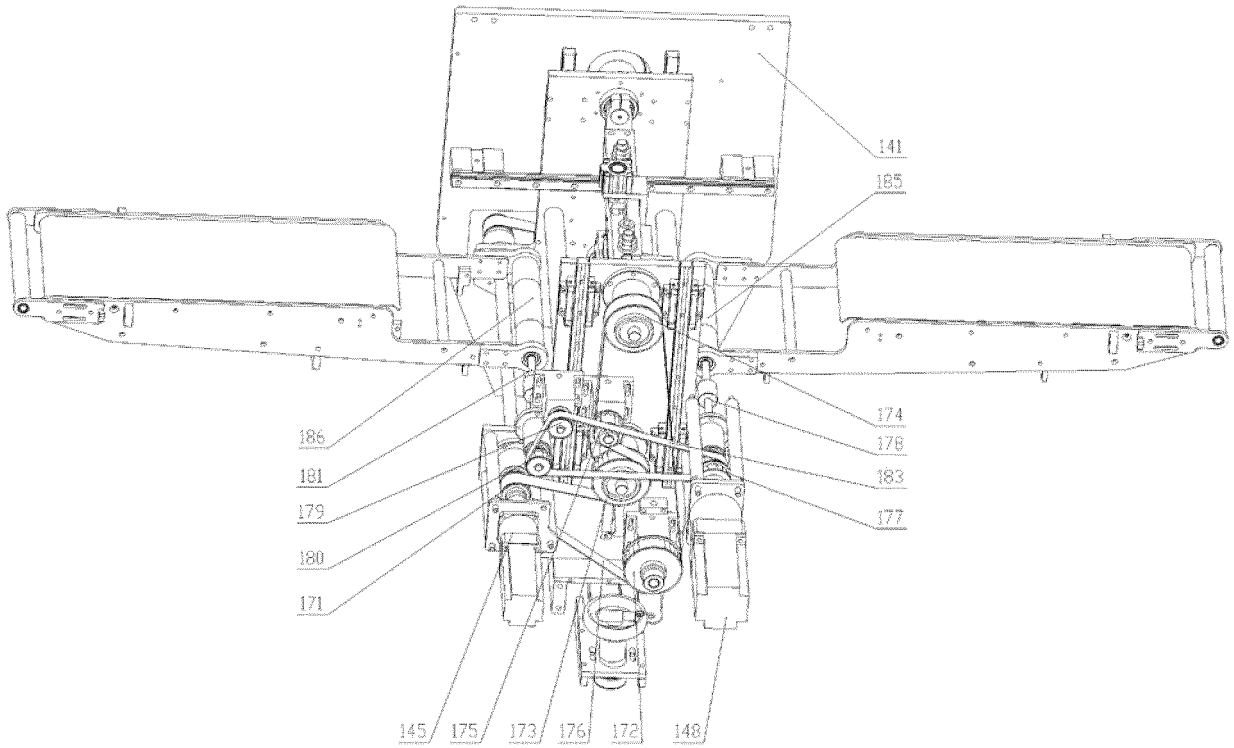
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Fig. 13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2016/111693

A. CLASSIFICATION OF SUBJECT MATTER

B65B 9/10 (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)

B65B

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

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

CNABS, DWPI, CNKI: line made by folding, indentation, pack+, bag, film, seal???, fold???, vertical sealing, transverse sealing, bend???, press???, box

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 105775193 A (QINGDAO HAIKEJIA ELECTRONIC EQUIPMENT MANUFACTURING CO., LTD.), 20 July 2016 (20.07.2016), claims 1-10	1-10
X	CN 1172753 A (NIPPON SEIKI CO., LTD.), 11 February 1998 (11.02.1998), description, page 5, paragraph 5 to page 11, paragraph 6, and figures 1-4	1
A	CN 201647142 U (QINGDAO HAIKEJIA ELECTRONIC EQUIPMENT MANUFACTURING CO., LTD.), 24 November 2010 (24.11.2010), the whole document	1-10
A	EP 1291290 A1 (TETRA LAVAL HOLDINGS & FINANCE), 12 March 2003 (12.03.2003), the whole document	1-10
A	US 2006021300 A1 (TADA, T. et al.), 02 February 2006 (02.02.2006), the whole document	1-10

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 February 2017 (16.02.2017)	**09 March 2017 (09.03.2017)**
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer **NIU, Ben** Telephone No.: (86-10) **62085802**

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2016/111693

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 105775193 A	20 July 2016	None	
CN 1172753 A	11 February 1998	CN 1113778 C	09 July 2003
		KR 100196120 B1	15 June 1999
		JP H09295615 A	18 November 1997
		KR 97069825 A	07 November 1997
CN 201647142 U	24 November 2010	None	
EP 1291290 A1	12 March 2003	HK 1071555 A1	26 June 2009
		WO 03022708 A1	20 March 2003
		CN 100422058 C	01 October 2008
		CN 1551850 A	01 December 2004
		AU 2002340870 A1	24 March 2003
US 2006021300 A1	02 February 2006	CN 1705586 A	07 December 2005
		US 7114307 B2	03 October 2006
		JP 2004149145 A	27 May 2004
		WO 2004039674 A1	13 May 2004

Form PCT/ISA/210 (patent family annex) (July 2009)