AUTOMOBILE STAMPING DIE PREPARATION CRANE

FIELD OF TECHNOLOGY

[0001] The present invention relates to the technical field of a crane, in particular to an automobile stamping die preparation crane.

BACKGROUND

[0002] With the continuous development of China's economy, a demand for automobile assembly and intelligent and flexible manufacturing of automobile parts is constantly increasing, in which a die stamping automobile body production line realizes efficient and reliable manufacturing through an intelligent stamping machine, but front processes before the stamping machine are respectively press die preparation, die storage and stacking, die repair, die identification, material preparation, etc. At present, they are still completed by manual operation of a conventional crane in industry, which results in long die preparation time and reduced efficiency of the production line. A spreader of a conventional crane can not be well adapted to a die in a process of lifting the die. It can not be adjusted and matched according to different die specifications, and there would be a deflectional problem in the process of lifting the die, which has potential safety hazards and many inconveniences in use.

SUMMARY

[0003] A technical problem to be solved by the present invention is to overcome the existing defects. Provided is an automobile stamping die preparation crane, which can adjust the position of a clamp arm according to the size of a die, be suitable for picking up dies of different specifications, be convenient and quick to be used, and realize adaptive-balance of an X-direction telescopic mechanism in a horizontal direction through a leveling mechanism to avoid a deflection problem in a process of lifting the die, realize quick disassembly of a lifting frame and a spreader, and effectively solve the problems in the background art.

[0004] To realize the above purpose, the present invention provides the following technical solution:

[0005] An automobile stamping die preparation crane, comprising a running cart, a running trolley, a lifting frame and a spreader, wherein the running trolley walks on a track of the running cart, the running trolley drives the lifting frame to lift through a lifting mechanism and a steel wire rope, and the lifting frame is connected with the spreader through four groups of quick-release mechanisms;

[0006] the spreader comprises at least one Y-direction telescopic mechanism and two X-direction telescopic mechanisms; the two X-direction telescopic mechanisms are symmetrically arranged on two telescopic ends of the Y-direction telescopic mechanism; the Y-direction telescopic mechanism comprises a first fixed sleeve, two first telescopic columns and a first driving structure, the first driving structure drives the two first telescopic columns to move synchronously face to face or away from each other; and each X-direction telescopic mechanism comprises a second fixed sleeve, two second telescopic columns and a second driving structure, the second driving structure drives the two second telescopic columns to move synchronously face to face or away from each other, and two away-from ends of the two second telescopic columns are both provided with opposite clamp arms;

[0007] two away-from side surfaces of the second fixed sleeve are both correspondingly provided with lifting lugs, an end of the first telescopic column is provided with a mounting shell, and the X-direction telescopic mechanism is located in the mounting shell and connected with the lifting lugs through a pin shaft; a leveling mechanism enabling the X-direction telescopic mechanism to adaptively balance in a horizontal direction is arranged in a lower part of the pin shaft in the mounting shell; the leveling mechanism comprises two L-shaped crank arms, the two crank arms are in rotatable symmetry, the two crank arms are rotatably connected in the mounting shell through fixed shafts, outer-side free ends of the two crank arms are both hinged to the X-direction telescopic mechanism through connecting rods, hinge points of the two connecting rods with the X-direction telescopic mechanism and rotation centers of the two crank arms are symmetrical with respect to a vertical surface where a center of the pin shaft is located, and inner-side free ends of the two crank arms are correspondingly hinged through an elastic arm.

[0008] Preferably, each quick-release mechanism comprises a first connecting piece, a connecting pin shaft and a second connecting piece, the four first connecting pieces are

connected with the lifting frame, the four second connecting pieces are connected with the spreader, and each of the first connecting pieces and the second connecting pieces is provided with a through hole for the connecting pin shaft to pass through; one end of the connecting pin shaft is provided with a narrow shaft segment, the narrow shaft segment is movably sleeved with an anti-trip ring, and an end of the narrow shaft segment is provided with a fixed block for preventing release of the anti-trip ring; and an outer diameter of the anti-trip ring is equal to a diameter of the connecting pin shaft, and an inner diameter of the anti-trip ring is greater than a diameter of the narrow shaft segment.

[0009] Preferably, the fixed block has the same diameter as the connecting pin shaft, the fixed block is far from a cross-sectional chamfer of the connecting pin shaft, and the fixed block is spot-welded and fixed to the narrow shaft segment.

[0010] Preferably, the first driving structure comprises a first driving motor, a driving wheel, a driven wheel and a ring chain, wherein the first driving motor is located at an upper part of the first fixed sleeve, and the driving wheel, the driven wheel and the ring chain are all arranged at an inner upper part of the first fixed sleeve, the first driving motor drives the driving wheel to rotate, the two first telescopic columns are respectively fixed on two away-from sides of the ring chain, and the first telescopic columns are in guiding sliding fit with the first fixed sleeve.

[0011] Preferably, the second driving structure comprises a second driving motor and two screw nut kinematic pairs, the second driving motor drives the two screw nut kinematic pairs to rotate reversly and synchronously through a gear box, the two screw nut kinematic pairs both drive a corresponding second telescopic column to act, and the second telescopic column is in guiding sliding fit with the second fixed sleeve.

[0012] Preferably, a number of the Y-direction telescopic mechanisms are two, the two Y-direction telescopic mechanisms are arranged in parallel, upper parts of the two Y-direction telescopic mechanisms are provided with a fixed seat, an upper part of the fixed seat is connected with a connecting frame through a slewing support, the connecting frame is connected with the lifting frame through the four groups of quick-release mechanisms, a lower part of the connecting frame is provided with a fluted disc, the fixed seat is provided with a reducer which drives a gear to rotate, and the gear engages with the fluted disc.

[0013] Preferably, the end of the first telescopic column and an end surface of the first fixed sleeve as well as the end surfaces of the second telescopic column and the second fixed sleeve are all correspondingly provided with rope encoders.

[0014] Preferably, four corners of the lifting frame are all provided with fixed pulleys, and the fixed pulleys are connected with the lifting mechanism of the running trolley through a steel wire rope.

[0015] Preferably, the elastic arm comprises two fixed arms, opposite ends of the two fixed arms are connected by a spring, and the farther ends of the two fixed arms are respectively hinged to free ends of the two crank arms.

[0016] Compared with the prior art, the present invention has the following advantages: the running trolley can walk on the running cart, and the running trolley can drive the spreader to lift through the lifting mechanism and the lifting frame to realize a lifting and transferring function of the die; through the Y-direction telescopic mechanism and X-direction telescopic mechanisms, the position of the clamp arm can be adjusted according to the size of the die, which is suitable for clamping dies of different specifications, and is convenient and quick to be used; and the leveling mechanism is used to realize the adaptive-balance of the X-direction telescopic mechanisms in the horizontal direction. When the clamp arm on one side of the X-direction telescopic mechanism has a large bearing load, that is, the X-direction telescopic mechanism would be skewed, the connecting rod on the side with the large bearing load moves down, and the crank arm connected to it swings, and the crank arm swings the other crank arm through the elastic arm. The other crank arm makes the other side of the X-direction telescopic mechanism move downwards through the connecting rod connected to it, that is, the stress of the load bearing side of the X-direction telescopic mechanism can be transferred to the non-load-bearing side, so that the X-direction telescopic mechanism can maintain horizontal balance and avoid the deflection problem in the process of lifting the die. In addition, rapid disassembly of the lifting frame and spreader is realized through the quick-release mechanisms.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Fig. 1 is a structure diagram of the present invention;

[0018] Fig. 2 is a connection diagram of a running trolley, a lifting frame and a spreader in structure of the present invention;

[0019] Fig. 3 is a structure diagram of a quick-release mechanism of the present invention;

[0020] Fig. 4 is a connection diagram of the lifting frame and the spreader of the present invention;

[0021] Fig. 5 is a structure diagram of the spreader of the present invention;

[0022] Fig. 6 is a local structure diagram of the spreader of the present invention;

[0023] Fig. 7 is a structure diagram of an X-direction telescopic mechanism of the present invention;

[0024] Fig. 8 is a structure diagram of a first driving structure of the present invention;

[0025] Fig. 9 is a connection diagram of the X-direction telescopic mechanism of the present invention; and

[0026] Fig. 10 is a structure diagram of a levelling mechanism of the present invention.

[0027] In the figures:

[0028] 1. running cart;

[0029] 2. running trolley;

[0030] 3. lifting frame;

[0031] 4. quick-release mechanism, 4.1. first connecting piece, 4.2. connecting pin shaft, 4.3. narrow shaft segment, 4.4. fixed block, 4.5. anti-trip ring, 4.6. second connecting piece;

[0032] 5. Y-direction telescopic mechanism, 5.1. first fixed sleeve, 5.2. first telescopic column, 5.3. first driving motor, 5.4. mounting shell, 5.5. driving wheel, 5.6. ring chain, 5.7. driven wheel;

[0033] 6. X-direction telescopic mechanism, 6.1. screw nut movement pair, 6.2. lifting lug, 6.3. second telescopic column, 6.4. clamp arm, 6.5. second fixed sleeve, 6.6. second driving motor;

[0034] 7. connecting frame; and

[0035] 8. leveling mechanism, 8.1. crank arm, 8.2. connecting rod, 8.3. elastic arm.

DESCRIPTION OF THE EMBODIMENTS

[0036] The present invention can be explained in detail by the following embodiments, and the purpose of disclosing the present invention is to protect all technical improvements within the scope of the present invention. In the description of the present invention, it should be understood that if there is an orientation or position relationship indicated by a term such as "up", "down", "front", "back", "left", "right", it only corresponds to drawings attached to this application. In order to facilitate the description of the present invention, it is not indicated or implied that a device or an element referred to must have a particular orientation.

[0037] Refer to Fig. 1 to Fig. 10, a technical solution is provided in the present invention: an automobile stamping die preparation crane, comprising a running cart 1, a running trolley 2, a lifting frame 3 and a spreader, wherein the running trolley 2 walks on a track of the running cart 1, the running trolley 2 drives the lifting frame 3 to lift through a lifting mechanism and a steel wire rope, and the lifting frame 3 is connected with the spreader through four groups of quick-release mechanisms 4; and the running trolley 2 can walk on the running cart 1, and the running trolley 2 can drive the spreader to lift through the lifting mechanism and the lifting frame 3 to realize a lifting and transferring function of the die.

[0038] The spreader comprises at least one Y-direction telescopic mechanism 5 and two X-direction telescopic mechanisms 6; the two X-direction telescopic mechanisms 6 are symmetrically arranged on two telescopic ends of the Y-direction telescopic mechanism 5; the Y-direction telescopic mechanism 5 comprises a first fixed sleeve 5.1, two first telescopic columns 5.2 and a first driving structure, the first driving structure drives the two first telescopic columns 5.2 to move synchronously face to face or away from each other; and each X-direction telescopic mechanism 6 comprises a second fixed sleeve 6.5, two second telescopic columns 6.3 and a second driving structure, the second driving structure drives the two second telescopic columns 6.3 to move synchronously face to face or away from each other, and two away-from ends of the two second telescopic columns 6.3 are both provided with opposite clamp arms 6.4; and the Y-direction telescopic mechanism 5 can be extended to drive the X-direction telescopic mechanisms 6 at both ends thereof close to or away from

each other, and the X-direction telescopic mechanisms 6 can be extended to drive the two clamp arms 6.4 close to or away from each other by changing a span length of the two X-direction telescopic mechanisms 6, so that positions of the clamp arms 6.4 in a horizontal plane can be changed arbitrarily, and the positions of the clamp arms 6.4 can be adjusted according to the size of a die, which is suitable for clamping dies of different specifications.

[0039] two away-from side surfaces of the second fixed sleeve 6.5 are both correspondingly provided with lifting lugs 6.2, an end of the first telescopic column 5.2 is provided with a mounting shell 5.4, and the X-direction telescopic mechanism 6 is located in the mounting shell 5.4 and connected with the lifting lugs 6.2 through a pin shaft; a leveling mechanism 8 enabling the X-direction telescopic mechanism 6 to adaptively balance in a horizontal direction is arranged in a lower part of the pin shaft in the mounting shell 5.4; the leveling mechanism 8 comprises two L-shaped crank arms 8.1, the two crank arms 8.1 are in rotatable symmetry, the two crank arms 8.1 are rotatably connected in the mounting shell 5.4 through fixed shafts, outer-side free ends of the two crank arms 8.1 are both hinged to the X-direction telescopic mechanism 6 through connecting rods 8.2, hinge points of the two connecting rods 8.2 with the X-direction telescopic mechanism 6 and rotation centers of the two crank arms 8.1 are symmetrical with respect to a vertical surface where a center of the pin shaft is located, and inner-side free ends of the two crank arms 8.1 are correspondingly hinged through an elastic arm 8.3.

[0040] It can be understood that since the X-direction telescopic mechanism 6 is connected to the lifting lug 6.2 in the mounting shell 5.4 through the pin shaft, the unstable center of gravity during the lifting of the die would cause the X-direction telescopic mechanism 6 to skew, resulting in a die deflection problem, so it is necessary to maintain the horizontal balance of the X-direction telescopic mechanism 6. After using the leveling mechanism 8, when the clamp arm 6.4 on one side of the X-direction telescopic mechanism 6 has a large bearing load, that is, the X-direction telescopic mechanism 6 would be skewed, the connecting rod 8.2 on the side with the large bearing load moves down, and the crank arm 8.1 connected to it swings, and the crank arm 8.1 swings the other crank arm 8.1 through the elastic arm 8.3. The other crank arm 8.1 makes the other side of the X-direction telescopic mechanism 6 move downwards through the connecting rod 8.2 connected to it, that is, the

stress of the load bearing side of the X-direction telescopic mechanism 6 can be transferred to the non-load-bearing side, so that the X-direction telescopic mechanism 6 can maintain horizontal balance and avoid the deflection problem in the process of lifting the die.

[0041] Further, each quick-release mechanism 4 comprises a first connecting piece 4.1, a connecting pin shaft 4.2 and a second connecting piece 4.6, the four first connecting pieces 4.1 are connected with the lifting frame 3, the four second connecting pieces 4.6 are connected with the spreader, and each of the first connecting pieces 4.1 and the second connecting pieces 4.6 is provided with a through hole for the connecting pin shaft 4.2 to pass through; one end of the connecting pin shaft 4.2 is provided with a narrow shaft segment 4.3, the narrow shaft segment 4.3 is movably sleeved with an anti-trip ring 4.5, and an end of the narrow shaft segment 4.3 is provided with a fixed block 4.4 for preventing release of the anti-trip ring 4.5; and an outer diameter of the anti-trip ring 4.5 is equal to a diameter of the connecting pin shaft 4.2, and an inner diameter of the anti-trip ring 4.5 is greater than a diameter of the narrow shaft segment 4.3; the fixed block 4.4 has the same diameter as the connecting pin shaft 4.2, the fixed block 4.4 is far from a cross-sectional chamfer of the connecting pin shaft 4.2, and the fixed block 4.4 is spot-welded and fixed to the narrow shaft segment 4.3; and the connection pin shaft 4.2 is inserted between the first connecting piece 4.1 and the second connecting piece 4.6. Since an outer diameter of the anti-trip ring 4.5 is equal to the diameter of the connecting pin shaft 4.2, the anti-trip ring 4.2 can be inserted together with the connecting pin shaft 4.2. After the insertion of the anti-trip ring 4.5, the connecting pin shaft 4.2 can be prevented from release under its own gravity. Therefore, in a case of a fixed connection, non-hydraulic and electric mechanisms are used to realize the quick connection and release of the lifting frame 3 and the spreader by manpower, and the whole process is convenient and efficient.

[0042] In this embodiment, the first driving structure comprises a first driving motor 5.3, a driving wheel 5.5, a driven wheel 5.7 and a ring chain 5.6, wherein the first driving motor 5.3 is located at an upper part of the first fixed sleeve 5.1, and the driving wheel 5.5, the driven wheel 5.7 and the ring chain 5.6 are all arranged at an inner upper part of the first fixed sleeve 5.1, the first driving motor 5.3 drives the driving wheel 5.5 to rotate, the two first telescopic columns 5.2 are respectively fixed on two away-from sides of the ring chain 5.6,

and the first telescopic columns 5.2 are in guiding sliding fit with the first fixed sleeve 5.1. That is, the first driving motor 5.3 drives the driving wheel 5.5 to rotate, the driving wheel 5.5 drives the ring chain 5.6 to act, and the ring chain 5.6 acts and drives the two first telescopic columns 5.2 to move face to face or away from each other in the first fixed sleeve 4.1, so as to achieve a telescopic function.

[0043] In this embodiment, the second driving structure comprises a second driving motor 6.6 and two screw nut kinematic pairs 6.1, the second driving motor 6.6 drives the two screw nut kinematic pairs 6.1 to rotate reversly and synchronously through a gear box, the two screw nut kinematic pairs 6.1 both drive a corresponding second telescopic column 6.3 to act, and the second telescopic column 6.3 is in guiding sliding fit with the second fixed sleeve 6.5. That is, the second driving motor 6.6 drives the two screw nut kinematic pairs 6.1 to rotate reversly and synchronously, screw nut seats of the two screw nut kinematic pairs 6.1 are set against each other, and the screw nut kinematic pairs 6.1 acts to drive the corresponding second telescopic column 6.3 to move in the second fixed sleeve 6.5 to achieve the telescopic function.

[0044] Further, a number of the Y-direction telescopic mechanisms 5 are two, the two Y-direction telescopic mechanisms 5 are arranged in parallel, upper parts of the two Y-direction telescopic mechanisms 5 are provided with a fixed seat, an upper part of the fixed seat is connected with a connecting frame 7 through a slewing support, the connecting frame 7 is connected with the lifting frame 3 through the four groups of quick-release mechanisms 4, a lower part of the connecting frame 7 is provided with a fluted disc, the fixed seat is provided with a reducer which drives a gear to rotate, and the gear engages with the fluted disc. As the reducer drives the gear to rotate, the gear engages with the fluted disc to realize a rotation function of the Y-direction telescopic mechanism 5, which is convenient to adjust according to a die placement angle and easy to operate.

[0045] Further, an end of the first telescopic column 5.2 and an end surface of the first fixed sleeve 5.1 as well as the end surfaces of the second telescopic column 6.3 and the second fixed sleeve 6.5 are all correspondingly provided with rope encoders. A telescopic quantities of the first telescopic column 5.2 and the second telescopic column 6.3 are located by the rope encoder to realize precise positioning of the spreader.

[0046] Further, the elastic arm 8.3 comprises two fixed arms, the opposite ends of the two fixed arms are connected by a spring, and the farther ends of the two fixed arms are respectively hinged to free ends of the two crank arms 8.1. That is, the elastic arm 8.3 can be stretched out and drawn back in a small range to meet swinging requirements of the two crank arms 8.1.

[0047] Furthermore, four corners of the lifting frame 3 are all provided with fixed pulleys 3.1, and the fixed pulleys 3.1 are connected with the lifting mechanism of the running trolley 2 through a steel wire rope.

[0048] The undetailed portion of the present invention is prior art, and it is obvious to a person skilled in the art that the present invention is not limited to the details of the above-mentioned exemplary embodiments and can be realized in other concrete forms without departing from the spirit or essential features of the present invention. Therefore, the embodiments should be regarded in all respects as exemplary and non-restrictive, aiming to include in the contents of the present invention all variations falling within the meaning and scope of equivalent elements.

WHAT IS CLAIMED IS:

1. An automobile stamping die preparation crane, comprising a running cart (1), a running trolley (2), a lifting frame (3) and a spreader, wherein the running trolley (2) walks on a track of the running cart (1), the running trolley (2) drives the lifting frame (3) to lift through a lifting mechanism and a steel wire rope, and the lifting frame (3) is connected with the spreader through four groups of quick-release mechanisms (4);

each quick-release mechanism (4) comprises a first connecting piece (4.1), a connecting pin shaft (4.2) and a second connecting piece (4.6), the four first connecting pieces (4.1) are connected with the lifting frame (3), the four second connecting pieces (4.6) are connected with the spreader, and each of the first connecting pieces (4.1) and the second connecting pieces (4.6) is provided with a through hole for the connecting pin shaft (4.2) to pass through; one end of the connecting pin shaft (4.2) is provided with a narrow shaft segment (4.3), the narrow shaft segment (4.3) is movably sleeved with an anti-trip ring (4.5), and an end of the narrow shaft segment (4.3) is provided with a fixed block (4.4) for preventing release of the anti-trip ring (4.5); and an outer diameter of the anti-trip ring (4.5) is equal to a diameter of the connecting pin shaft (4.2), and an inner diameter of the anti-trip ring (4.5) is greater than a diameter of the narrow shaft segment (4.3);

the spreader comprises at least one Y-direction telescopic mechanism (5) and two X-direction telescopic mechanisms (6); the two X-direction telescopic mechanisms (6) are symmetrically arranged on two telescopic ends of the Y-direction telescopic mechanism (5); the Y-direction telescopic mechanism (5) comprises a first fixed sleeve (5.1), two first telescopic columns (5.2) and a first driving structure, the first driving structure drives the two first telescopic columns (5.2) to move synchronously face to face or away from each other; and each X-direction telescopic mechanism (6) comprises a second fixed sleeve (6.5), two second telescopic columns (6.3) and a second driving structure, the second driving structure drives the two second telescopic columns (6.3) to move synchronously face to face or away from each other, and two away-from ends of the two second telescopic columns (6.3) are both provided with opposite clamp arms (6.4);

the first driving structure comprises a first driving motor (5.3), a driving wheel (5.5), a driven wheel (5.7) and a ring chain (5.6), wherein the first driving motor (5.3) is located at an

upper part of the first fixed sleeve (5.1), and the driving wheel (5.5), the driven wheel (5.7) and the ring chain (5.6) are all arranged at an inner upper part of the first fixed sleeve (5.1), the first driving motor (5.3) drives the driving wheel (5.5) to rotate, the two first telescopic columns (5.2) are respectively fixed on two away-from sides of the ring chain (5.6), and the first telescopic columns (5.2) are in guiding sliding fit with the first fixed sleeve (5.1); and the second driving structure comprises a second driving motor (6.6) and two screw nut kinematic pairs (6.1), the second driving motor (6.6) drives the two screw nut kinematic pairs (6.1) to rotate reversly and synchronously through a gear box, the two screw nut kinematic pairs (6.1) both drive a corresponding second telescopic column (6.3) to act, and the second telescopic column (6.3) is in guiding sliding fit with the second fixed sleeve (6.5); and

two away-from side surfaces of the second fixed sleeve (6.5) are both correspondingly provided with lifting lugs (6.2), an end of the first telescopic column (5.2) is provided with a mounting shell (5.4), and the X-direction telescopic mechanism (6) is located in the mounting shell (5.4) and connected with the lifting lugs (6.2) through a pin shaft; a leveling mechanism (8) enabling the X-direction telescopic mechanism (6) to adaptively balance in a horizontal direction is arranged in a lower part of the pin shaft in the mounting shell (5.4); the leveling mechanism (8) comprises two L-shaped crank arms (8.1), and the two crank arms (8.1) are in rotatable symmetry, the two crank arms (8.1) are rotatably connected in the mounting shell (5.4) through fixed shafts, outer-side free ends of the two crank arms (8.1) are both hinged to the X-direction telescopic mechanism (6) through connecting rods (8.2), hinge points of the two connecting rods (8.2) with the X-direction telescopic mechanism (6) and rotation centers of the two crank arms (8.1) are symmetrical with respect to a vertical surface where a center of the pin shaft is located, and inner-side free ends of the two crank arms (8.1) are correspondingly hinged through an elastic arm (8.3); and the elastic arm (8.3) comprises two fixed arms, opposite ends of the two fixed arms are connected by a spring, and farther ends of the two fixed arms are respectively hinged to free ends of the two crank arms (8.1).

2. The automobile stamping die preparation crane according to claim 1, wherein the fixed block (4.4) has the same diameter as the connecting pin shaft (4.2), the fixed block (4.4) is far from a cross-sectional chamfer of the connecting pin shaft (4.2), and the fixed block (4.4) is spot-welded and fixed to the narrow shaft segment (4.3).

3. The automobile stamping die preparation crane according to claim 1, wherein a number of the Y-direction telescopic mechanisms (5) are two, the two Y-direction telescopic mechanisms (5) are arranged in parallel, upper parts of the two Y-direction telescopic mechanisms (5) are provided with a fixed seat, an upper part of the fixed seat is connected with a connecting frame (7) through a slewing support, the connecting frame (7) is connected with the lifting frame (3) through the four groups of quick-release mechanisms (4), a lower part of the connecting frame (7) is provided with a fluted disc, the fixed seat is provided with a reducer which drives a gear to rotate, and the gear engages with the fluted disc.

4. The automobile stamping die preparation crane according to claim 1, wherein the end of the first telescopic column (5.2) and an end surface of the first fixed sleeve (5.1) as well as the end surfaces of the second telescopic column (6.3) and the second fixed sleeve (6.5) are all correspondingly provided with rope encoders.

5. The automobile stamping die preparation crane according to claim 1, wherein four corners of the lifting frame (3) are all provided with fixed pulleys (3.1), and the fixed pulleys (3.1) are connected with the lifting mechanism of the running trolley (2) through a steel wire rope.