

CLAIMS

1. A workpiece ejecting system for use in stamping machine comprising:
- 5 (a) a die platen (10) linked to a punch (110) and having a die cavity (111) for holding a workpiece to be ejected therefrom;
- (b) a picker (20) vertically aligned with the die cavity (111) on the die platen (10), wherein the die cavity (111) has the shaped of the workpiece and is adaptable to hold the workpiece, and the workpiece is held by using a vacuum system;
- 10 (c) a linear guide bushing (30) in vertical alignment with the picker (20) to guide the direction of either upward or downward movement of the picker (20);
- (d) a floating base (40) being used for mounting the linear guide bushing (30) and for integrating with an outsource stage and/or an actuator for a purpose of transferring or conveying the workpiece to a processing step;
- 15 (e) a linear actuator (70) which is located underneath of a spring plunger mechanism to generate both the upward and downward linear movement;
- (f) a linear guide shaft (50) having two ends and vertically slide along the linear guide bushing (30) which can move in upward and downward direction to push the picker (20);
- 20 (g) a spring cap (60) connected to the linear guide shaft (50) for restricting the maximum travel of the linear guide shaft (50) vertically and for holding a loaded spring (80) in the linear guide shaft (50), wherein the load spring (80) is vertically aligned to the linear guide shaft (50), the linear guide bushing (30) and the picker (20) to hold the picker (20) to be seated properly on the floating base (40) and to accelerate a downward movement of the picker (20); and
- 25 (h) a positioning sensor (90) integrated with the linear actuator (70) for measuring and triggering both the upward and downward of the movement of the linear actuator (70) and the spring plunger mechanism, respectively,
- 30 thereby the workpiece is ejected directly from the die cavity (111) to the picker and is then, with the associate of an outsource stage and/or the actuator, transferred to a packaging machine to pack the workpiece.

2. The workpiece ejecting system as set forth in Claim 1, wherein the spring plunger mechanism comprises: the picker (20) vertically mounted onto one end of the linear guide shaft (50), which slides along the hole (32) of the linear guide bushing (30) is located on the floating base (40), and
5 underneath the floating base is the spring cap (60) mounted onto the other end of the linear guide shaft (70) to hold the load spring (80) in vertically align to it.
3. The workpiece ejecting system as set forth in Claim 2, wherein the
10 outsource stage and/or the actuator includes the linear and the rotary actuator.
4. The workpiece ejecting system as set forth in Claim 1, wherein the
15 positioning sensor (90) is integrated to the linear actuator (70) such that when the positioning sensor (90) detects the movement of the punch (110), the linear actuator (70) will proceed to move upward to push the spring plunger mechanism up when the punch (110) goes down and downward to release the load spring (80) of the spring plunger mechanism when the punch (110) is withdrawing from the die cavity (111).
5. The workpiece ejecting system as set forth in Claim 1, wherein the upward
20 movement is performed by the pushing force of the linear actuator (70) against the load spring (80) of the spring plunger mechanism.
6. The workpiece ejecting system as set forth in Claim 1, wherein the
downward movement is associated by a releasing force of the linear actuator (70) and the load spring (80) of the spring plunger mechanism.
7. The workpiece ejecting system as set forth in Claim 1, wherein the floating
25 base (40) is used to hold the workpiece ejecting system, and the floating base (40) is integrated with the outsource stage and/or the actuator.
8. The workpiece ejecting system as set forth in Claim 1, wherein the spring plunger mechanism is located directly underneath of the die platen (10) but above the position of the linear actuator (70).
- 30 9. The workpiece ejecting system as set forth in Claim 1, wherein the spring plunger mechanism is adjustable to provide a stroke based on the height of the die platen (10) to the die cavity (111) by increasing the length of the linear guide shaft (50) and the load spring (80).

10. The workpiece ejecting system as set forth in Claim 1, wherein the picker (20) is interchangeable with an alternative picker design to serve a several shape and size of the ejecting workpiece as well the die cavity (111).
- 5 11. The workpiece ejecting system as set forth in Claim 1, wherein a vacuum system is integrated to the picker (20) to hold a workpiece in place on the top surface of the picker of the ejecting system.
12. The workpiece ejecting system as set forth in Claim 11, wherein a plurality of holes (28) are provided on the top surface of the picker (20) for holding the workpiece.
- 10 13. The workpiece ejecting system as set forth in Claim 12, wherein the plurality of holes on the picker (20) are arranged or positioned based on the shape of the workpiece.
14. The workpiece ejecting system as set forth in Claim 1, wherein the positioning sensor (90) is integrated together with the actuator (70).
- 15 15. The workpiece ejecting system as set forth in Claim 14, wherein the picker (20) is moveable into the die cavity (111) to fetch the workpiece for ejecting out.