ADHESIVE TAPE APPLYING MACHINE FOR USE WITH A STRETCH WRAPPER

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ABSTRACT

An adhesive tape applying machine includes two first power sources secured in vertical position, a moving rod joined to output rods of the first power sources at two ends, a second power source connected to the moving rod with an output rod being displaceable in a horizontal direction, a supporting seat joined to the output shaft of the second power source, and an adhesive tape applying mechanism, which is supported on a lower end portion of the supporting seat, and which will apply adhesive tape on an object when it is pressed against and displaced relative to the object; the machine is positioned next to a stretch wrapper such that after the stretch wrapper winds a plastic film around an object, adhesive tape will be stuck on the object and a tail end portion of the plastic film with the adhesive tape applying machine.
ADHESIVE TAPE APPLYING MACHINE FOR USE WITH A STRETCH WRAPPER

RELATED APPLICATIONS

[0001] This application is a Continuation patent application of co-pending Ser. No. 11/142,286, filed on 2 Jun. 2005.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The invention relates to an adhesive tape applying machine, more particularly one, which will apply adhesive tape on an object when it is pressed against and displaced relative to the object, and which is positioned next to a stretch wrapper for applying adhesive tape to an object and a tail end portion of a plastic film, which is wound around the object by means of the stretch wrapper, thus smoothing and fixing the tail end portion of the plastic film.

[0004] 2. Brief Description of the Prior Art

[0005] Stretch wrappers are very convenient packing machines, which are used to wind a plastic film around an object or a group of objects stacked on a pallet. A stretch wrapper includes a main unit, and a rotary platform. The main unit has a roll of plastic film thereon, and a cutter for cutting the plastic film. Thus, a plastic film will be wound around an object by means of actuating both the main unit and the rotary platform when the object is supported on the rotary platform; the cutter of the main unit will cut the plastic film after the winding process is finished. After the cutting action, a tail end portion of the plastic film is prone to project from the object and move around. Consequently, an electronic sensing and positioning equipment in the warehouse will make mistakes because of the projecting tail end portion of the plastic film around the object.

[0006] Conventionally, the tail end portion of the plastic film is manually adhered to the object to prevent such a mistake from happening. In light of the fact that time and labor can be saved if automatic adhesive tape applying machines are used to adhere the tail end portion of the plastic film on the object instead of hands, an adhesive tape applying machine is made available by the inventor.

SUMMARY OF THE INVENTION

[0007] It is a main object of the invention to provide an adhesive tape applying machine for use with a stretch wrapper to overcome the above-mentioned problem. The adhesive tape applying machine includes two first power sources secured in vertical position, a moving rod joined to output rods of the first power sources at two ends, a second power source connected to the moving rod with an output rod being displaceable in a horizontal direction, a supporting seat joined to the output shaft of the second power source, and an adhesive tape applying mechanism, which is supported on a lower end portion of the supporting seat, and which will apply adhesive tape on an object when it is pressed against and displaced relative to the object. The machine is positioned next to a stretch wrapper such that after the stretch wrapper winds a plastic film around an object, adhesive tape will be stuck on the object and a tail end portion of the plastic film.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present invention will be better understood by referring to the accompanying drawings, wherein:

[0009] FIG. 1 is a top view of a stretch wrapper and the first preferred embodiment of an adhesive tape applying machine in the invention,

[0010] FIG. 2 is a front view of the first preferred embodiment,

[0011] FIG. 3 is a side view of the stretch wrapper and the first preferred embodiment,

[0012] FIG. 4 is a plan of the adhesive tape applying mechanism,

[0013] FIG. 5 is a view of the invention being used in the first way (1),

[0014] FIG. 6 is a view of the invention being used in the first way (2),

[0015] FIG. 7 is a view of the invention being used in the second way,

[0016] FIG. 8 is a front view of the second preferred embodiment,

[0017] FIG. 9 is a view of the second embodiment being used (1),

[0018] FIG. 10 is a view of the second embodiment being used (2),

[0019] FIG. 11 is a side view of the second type of adhesive tape applying mechanism in the present invention,

[0020] FIG. 12 is a view of the second type of adhesive tape applying mechanism being used (1), and

[0021] FIG. 13 is a view of the second type of adhesive tape applying mechanism being used (2).

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] Referring to FIGS. 1 to 3, a first preferred embodiment of an adhesive tape applying machine 1 is positioned next to a stretch wrapper (B) such that after the stretch wrapper (B) makes a plastic film wound around an object (A), an adhesive tape can be applied to fix a tail end portion of the plastic film on the object (A) by means of the adhesive tape applying machine 1.

[0023] The adhesive tape applying machine 1 includes a frame 10, two first power sources 11, a moving rod 12, a second power source 13, a supporting seat 14, two linear rails 15, and an adhesive tape applying mechanism 16.

[0024] The first power sources 11 are located in the position next to respective ones of two vertical portions of the frame 10 with output rods 111 thereof pointing upwards.

[0025] The moving rod 12 is joined to the output rods 111 of the first power sources 11 in a horizontal position, and it is connected to, and up and down displaceable relative to two secured vertical guide rods 121 at two ends thereof.

[0026] The second power source 13 is connected to the moving rod 12 in a horizontal position such that an output rod 131 thereof is displaceable in the horizontal direction.
[0027] The linear rails 15 are secured on the moving rod 12. The supporting seat 14 is joined to the output rod 131 of the second power source 13, and it supported on the linear rails 15 such that when the second power source 13 functions, the supporting seat 14 will be moved along the linear rails 15.

[0028] Referring to FIG. 4, the adhesive tape applying mechanism 16 includes a frame, an air cylinder 2, a roller and arm assembly 3, a cutter 5, a moving arm 6, and an elastic element 7. The frame of the adhesive tape applying mechanism 16 is supported on a lower end of the other side of the supporting seat 14 to face the object (A), and it can be in a vertical position or alternatively it can be in a horizontal position. The air cylinder 2 is secured on the frame. The roller and arm assembly 3 includes a co-moving arm 31, and a smoothing roller 32; the co-moving arm 31 is pivoted to a piston rod 21 of the air cylinder 2 at a first end, and pivoted to the frame at a middle portion thereof; the smoothing roller 32 is supported on a second end of the co-moving arm 31. The cutter 5 is supported on the frame for cutting the adhesive tape. The smoothing roller 32 will touch a blade 51 of the cutter 5 when the piston rod 21 is in the withdrawn position. The moving arm 6 is pivot to the frame at a first end thereof while a second smoothing roller 61 is supported on a second end of the moving arm 6. The elastic element 7 is secured to the frame at one end, and connected to a portion of the moving arm 6 that is between the first and the second ends.

[0029] Referring to FIGS. 5, and 6, after a plastic film is wound around the object (A) by means of the stretch wrapper (B), first the plastic film is cut, and the adhesive tape applying mechanism 16 is moved towards, and pressed against the object (A) together with the supporting seat 14 by means of the second power source 13; thus, the adhesive tape is applied on the tail end portion of the plastic film on the object (A). Then, the first power source 11 are actuated to move the adhesive tape applying mechanism 16 from a higher place to a lower one when the smoothing rollers 32 and 61 are pressed against the object (A). Consequently, the tail end portion of the plastic film is fixed on the object (A), and smoothed out.

[0030] Referring to FIG. 7, which shows another way to use the first preferred embodiment, instead of moving the adhesive tape applying mechanism 16 from a higher place to a lower one, the rotary platform (A1) of the stretch wrapper (B) is actuated to cause revolution of the object (A) after a plastic film is wound around the object (A), and cut, and after the adhesive tape applying mechanism 16 is moved towards the object (A) together with the supporting seat 14 to apply the adhesive tape on the tail end portion of the plastic film on the object (A). Thus, the tail end portion of the plastic film is fixed on the object (A), and smoothed out.

[0031] Referring to FIGS. 8, 9, and 10, a second preferred embodiment of an adhesive tape applying machine 1 is provided, which includes:

- a frame (10a);
- two vertical guide rods (121a);
- two moving rods (12a); each of the moving rods (12a) being connected to the vertical guide rods (121a) at two ends thereof; the moving rods (12a) being adjustable in height thereof;
- two power sources (13a); the power sources (13a) being connected to respective ones of the moving rods (12a) in a horizontal position such that output shafts (131a) thereof are displaceable in the horizontal direction;
- linear rails (15a) secured on the moving rods (12a);
- two supporting seats (14a) joined to respective ones of the output shafts (131a) of the power sources (13a); the supporting seats (14a) being secured on the linear rails (15a) such that when the power source (13a) function, the supporting seats (14a) will be moved along the linear rails (15a); and
- two adhesive tape applying mechanisms (16a), which are the same as that of the first preferred embodiment, and supported on respective ones of the supporting seats (14a).

[0032] After a plastic film is wound around an object (A), and cut by means of the stretch wrapper (B), the object (A) is first conveyed to pass the adhesive tape applying machine 1. When the object (A) is passing the machine 1, the adhesive tape applying mechanisms (16a) are moved forwards, and pressed against the object (A) by means of the power sources (13a); thus, adhesive tapes are applied on the tail end portion of the plastic film wound around the object (A). Therefore, the tail end portion of the plastic film will be fixed on the object (A), and smoothed out after the object (A) passes the adhesive tape applying machine 1.

[0040] Referring to FIGS. 11, and 12, which shows an improvement on the first preferred embodiment, wherein the supporting seat 14 is further formed with a horizontal extension plate portion 141 at the lower end, and a turning disk 142 is supported on the horizontal extension plate portion 141, and the frame of the adhesive tape applying mechanism 16 is hung on and pivoted to a shaft portion 143 on the turning disk 142; thus, if outer sides of object (A) aren’t flat, the object (A) will make the adhesive tape applying mechanism 16 change orientation according to the shape of the object (A) when the adhesive tape applying machine is used to apply adhesive tape on the object (A). Consequently, the smoothing rollers 32 and 61 will touch the object (A) closely, and the tail end portion of the plastic film will be effectively smoothed and fixed on the object (A). Furthermore, the frame of the adhesive tape applying mechanism 16 has curved slots 161 on two sides of the turning disk 142, and the horizontal extension plate portion 141 has two stopping protrusions 144, which are passed through respective ones of the curved slots 161; thus, angular displacement of the adhesive tape applying mechanism 16 will be within a certain range.

[0041] In addition, the present invention can be equipped with several adhesive tape applying mechanisms of the above structure instead of single one to suit the width of an object to be packaged with both the stretch wrapper (B) and the adhesive tape applying machine; thus, the tail end portion of the plastic film wound around the object will be effectively smoothed and fixed on the object.

1-8. (canceled)

9. A stretch wrap and adhesive tape system for stretch wrapping a plastic film around an object to be wrapped and securing adhesive tape to said stretch wrapped object comprising:

(a) a stretch wrapping mechanism for wrapping said object with said plastic film; and

(b) an adhesive tape application mechanism coupled to said stretch wrapping mechanism and displaced there-
from, said adhesive tape application mechanism being displaceably mounted on an adhesive tape frame including a first power source for displacing said adhesive tape application mechanism in a vertical direction and a second power source for displacing said adhesive tape mechanism in a horizontal direction for contacting said plastic film wrapped object, said adhesive tape application mechanism being displaced in said vertical direction subsequent to said adhesive tape mechanism being displaced into horizontal contact with said wrapped object.

10. The stretch wrap and adhesive tape applying system as claimed in claim 9, wherein the supporting seat is formed with a horizontal extension plate portion at a lower end and a rotationally displaceable disk is supported on the horizontal extension plate portion, said adhesive tape applying mechanism being hung on and pivoted to a shaft portion formed on the rotationally displaceable disk, said adhesive tape applying mechanism having curved slots on two sides of the rotationally displaceable disk, and the horizontal extension plate portion having two stopping protrusions passing through respective ones of the curved slots.

11. The stretch wrap and adhesive tape applying system as claimed in claim 9, which includes:

an air cylinder secured to said adhesive tape frame;

a co-moving arm, the co-moving arm being pivoted to a piston rod of the air cylinder at a first end thereof, and pivoted to the frame at a middle portion thereof, the co-moving arm having a second end;

a first smoothing roller supported on the second end of the co-moving arm;

a cutter supported on the frame for cutting an adhesive tape; the first smoothing roller normally touching a blade of the cutter;

a moving arm pivoted to the adhesive tape frame at a first end thereof, the moving arm having a second smoothing roller supported on a second end thereof; and

an elastic element secured to the adhesive tape frame at one end, and connected to a portion of the moving arm that is between the first and the second ends of the moving arm.

12. The stretch wrap and adhesive tape system as recited in claim 9 where said adhesive tape frame includes:

(a) a pair of vertically directed frame members and a pair of vertical guide rods; and

(b) a vertically displaceable rod coupled to said adhesive tape mechanism for vertically displacing said adhesive tape application mechanism.

13. The stretch wrap and adhesive tape system as recited in claim 9 where said adhesive tape frame includes:

(a) a horizontally displaceable rod coupled to said adhesive tape application mechanism for horizontally displacing said adhesive tape application mechanism;

(b) a pair of linear rails secured to said horizontally displaceable rod; and

(c) a supporting seat secured to said adhesive tape application mechanism, said supporting seat being displaceable on said linear rails.

14. A stretch wrap and adhesive tape system for stretch wrapping a plastic film around an object to be wrapped and securing adhesive tape to said stretch wrapped object comprising:

(a) a stretch wrapping mechanism for wrapping said object with said plastic film; and

(b) an adhesive tape application mechanism coupled to said stretch wrapping mechanism and displaced therefrom, said adhesive tape application mechanism being displaceably mounted on an adhesive tape frame including a power source for displacing said adhesive tape mechanism in a horizontal direction for contacting said plastic film wrapped object, said adhesive tape application mechanism being engaged subsequent to said adhesive tape mechanism being displaced into horizontal contact with said wrapped object.

15. The stretch wrap and adhesive tape applying system as claimed in claim 14, wherein the supporting seat is formed with a horizontal extension plate portion at a lower end, and a turning disk is supported on the horizontal extension plate portion, and the adhesive tape applying mechanism is hung on and pivoted to a shaft portion formed on the turning disk, and the adhesive tape applying mechanism has curved slots on two sides of the turning disk, and the horizontal extension plate portion has two stopping protrusions passing through respective ones of the curved slots.

16. The stretch wrap and adhesive tape applying system as recited in claim 15, including a plurality of adhesive tape applying mechanisms vertically displaced each from the other for contacting said object at a plurality of discrete vertical heights.

17. The stretch wrap and adhesive tape applying system as claimed in claim 14, wherein the adhesive tape applying system includes:

an air cylinder secured on the frame;

a co-moving arm, the co-moving arm being pivoted to a piston rod of the air cylinder at a first end thereof, and pivoted to the frame at a middle portion thereof; the co-moving arm having a second end;

a first smoothing roller supported on the second end of the co-moving arm;

a cutter supported on the frame for cutting an adhesive tape, the first smoothing roller normally touching a blade of the cutter;

a moving arm pivoted to the adhesive tape frame at a first end thereof, the moving arm having a second smoothing roller supported on a second end thereof; and

an elastic element secured to the frame at one end, and connected to a portion of the moving arm that is between the first and the second ends of the moving arm.

18. The stretch wrap and adhesive tape applying system as recited in claim 14, including a plurality of adhesive tape applying mechanisms vertically displaced each from the other for contacting said object at a plurality of discrete vertical heights.