

Description

This invention relates to an improved tool for melting hot melt adhesive on a fastening device as a preliminary step to bonding the fastening device to a mounting surface.

Description of the Prior Art

It is known to employ hot melt adhesives to bond anchoring devices to walls and other like mounting surfaces. Special tools are required to heat the anchoring devices and thereby melt the adhesives.

U. S. Patent No. 3,719,782 discloses one such tool where the anchoring device is received against the face of a relatively larger forwardly protruding heating element. In situations where a plurality of anchoring devices are being heated in rapid succession, the areas of the heating element which extend beyond the anchoring devices are exposed and thus may be contacted by a user's fingers.

U. S. Patent No. 4,167,259 discloses another prior art tool which is used in conjunction with a metal anchoring device. The anchoring device is specially configured and dimensioned to complete a magnetic flux circuit between the legs of a U-shaped induction core, thereby generating the heat required to melt the adhesive. This type of arrangement requires rather precise positioning of the anchoring device on the tool, and precludes the use of non-metallic anchoring devices, e.g., those molded of plastic.

One object of the present invention is to provide of a tool which is specially adapted to conveniently and safely accept an anchoring device for heating.

A companion objective of the present invention is to provide a tool which can be employed with both metallic and non-metallic anchoring devices.

SUMMARY OF THE INVENTION

The tool of the present invention is designed for use in applying an anchoring device having a forwardly protruding nose carrying hot melt adhesive and a rear recess surrounded by a circular rim. The fastening device may be metallic or non-metallic. The tool has a housing with both a head portion and a handle portion. The head portion has a front wall with a front recess, and oppositely facing side walls extending rearwardly from the front wall. A heater is contained in the head portion. The heater has a platen protruding through the front wall into the front recess. The front recess is appropriately configured and dimensioned to removably receive a fastening device on the platen, with the platen protruding into the rear recess of

the thus received anchoring device and into contact with the nose thereof. The heater is adapted to heat the platen and the nose of the anchoring device in contact therewith to melt the adhesive preparatory to pressing the nose of the anchoring device against a support surface. The platen is totally enclosed by the anchoring device received thereon.

Advantageously, the width of the tool's head portion between the side walls is less than the diameter of the circular rim on the anchoring device, thus allowing portions of the rim to protrude laterally beyond the side walls. These laterally protruding rim portions allow the anchoring device to be held between the fingers of the user and provide a means of easily and safely mounting the anchoring device on the heated platen.

To further enhance safety, the platen is located rearwardly of the plane of the front wall of the head portion. Preferably, this rearward location is at a distance which is slightly less than the thickness of the nose of the anchoring device. Thus, when the anchoring device is mounted on the platen, it protrudes slightly beyond the plane of the front wall to facilitate application to the mounting surface.

Other objects and advantages of the present invention will become more apparent as the description proceeds with the aid of the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a tool and anchoring device in accordance with the present invention;

Figure 2 is a longitudinal sectional view taken through the tool shown in Figure 1;

Figure 3 is a front view of the tool with an anchoring device received on the platen;

Figure 4 is a sectional view taken along line 4-4 of Figure 3; and

Figure 5 is a partial sectional view showing the anchoring device bonded to a mounting surface.

DESCRIPTION OF PREFERRED EMBODIMENT

With reference to the drawings, the tool of the present invention is designed for use with an anchoring device generally indicated at 10. The anchoring device has a forwardly protruding nose 12 carrying hot melt adhesive 14, and a rear recess 16 surrounded by a circular rim 18.

The tool 20 of the present invention has a head portion 20a and a handle portion 20b. The head portion includes a front wall 22 with oppositely facing side walls 24 extending rearwardly therefrom, and with a front recess 26 in the front wall. A heater 28 is contained in the head portion 20a. The

heater includes a platen 30 which protrudes through the front wall into the front recess 26. The front recess 26 is appropriately configured and dimensioned to receive the anchoring device 10 on the platen 30, with the platen protruding into the rear recess 16 of the thus received anchoring device and into contact with the underside of the nose 12. The platen 30 is thus totally enclosed by the anchoring device. The heater 28 is of the electrical resistance type and is adapted to be connected via wire 32 and plug 34 to a conventional electrical outlet (not shown). An indicator light 36 is included in the circuit and is visible through a window 38 in the housing. Light 36 provides a means of visually indicating when the heater is energized.

When energized, the heater raises the temperature of the platen 30 and the nose 12 of an anchoring device in contact therewith to melt the adhesive coating 14 preparatory to pressing the nose of the fastening device against a support surface. This results in the anchoring device becoming bonded to the support surface, as shown for example in Figure 5.

As can best be seen in Figure 3, the maximum width dimension "W" of the head portion 20a between the side walls 24 is less than the diameter "D" of the circular rim 18 on the anchoring device 10. Thus, when the anchoring device is mounted on the platen 30, portions of the rim 18 protrude laterally beyond the side walls 24, such laterally protruding portions being indicated in Figure 3 at 18'. These laterally protruding portions can be gripped between a user's fingers, thereby providing a convenient and safe means of handling the anchoring device without exposure to the heated platen 30.

In order to further enhance safety, the platen 30 is preferably recessed rearwardly of the plane "P" of the front wall 22 by a distance d_1 . Distance d_1 is less than the thickness of the nose portion 12. Thus, when the anchoring device is mounted on the platen, the nose portion protrudes forwardly beyond the plane P by a slight distance d_2 . Typically, d_1 will be 0.38mm (0.015") the thickness of the nose 12 will be 0.76mm (0.030"), thus making d_2 also approximately 0.38mm (0.015").

By locating the platen 30 slightly behind the plane P of the front wall 22, there is less likelihood of it being inadvertently contacted by the user. The slight forward protrusion of the nose 12 beyond the plane P enables the nose to be firmly pressed against a mounting surface to obtain secure bonding, with the remainder of the front wall 22 serving as a guide surface which resists cocking of the tool and thereby further enhances secure bonding.

As can be best seen in Figure 4, when the anchoring device is mounted on the platen 30, the

circular flange 18 is spaced forwardly from the base of the recess 26. This insures that there is intimate contact between the platen and the rear surface of the nose 12, thereby enhancing rapid and efficient heating.

Preferably, the side walls 24 are provided with vent openings indicated typically at 40. This allows ambient air to circulate freely through the head portion 20a.

As indicated in Figure 5, once the anchoring device 10 is securely bonded to a mounting surface, it serves as a base for removably supporting hooks or other like elements, as indicated for example by the broken lines at 42.

Various changes and modifications can be made to the embodiment herein chosen for purposes of disclosure without departing from the scope of the coverage provided by the claims appended hereto. Examples of such changes and modifications might include changing the configuration of the platen 30 to accommodate differently configured anchoring devices, elimination of the indicator light 36, heating the platen 30 by means other than an electrical resistance heater, etc.

Claims

1. A tool (20) for applying an anchoring device (10) to a support surface, the anchoring device having a forwardly protruding nose (12) carrying hot melt adhesive (14) and a rear recess surrounded by a circular rim (18), said tool (20) comprising:

a housing (20a, b; 24) having a head portion (20a);

a front wall (22) on said head portion (20a) with oppositely facing side walls (24) extending rearwardly therefrom, said front wall having forwardly protruding portions defining a front reference plane, with a front recess (26) in said front wall (22) located rearwardly of said front reference plane;

a heater (28) in said head portion (20a), said heater having a platen (30) protruding through said front wall (22) into said front recess (26), said front recess being dimensioned to removably receive one of the anchoring devices (10) on said platen (30), the dimensions of said front recess (26) and said platen (30) being such that the nose (12) of the thus received anchoring device protrudes forwardly beyond said front reference plane (P), with said platen (30) being dimensioned to protrude into the rear recess (16) of the thus received anchoring device (10) and into contact with the nose (12) hereof, said heater (28) being adapted to heat said platen (30) and the nose (12) of the anchoring device (10) in contact therewith

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heater includes a platen 30 which protrudes through the front wall into the front recess 26. The front recess 26 is appropriately configured and dimensioned to receive the anchoring device 10 on the platen 30, with the platen protruding into the rear recess 16 of the thus received anchoring device and into contact with the underside of the nose 12. The platen 30 is thus totally enclosed by the anchoring device. The heater 28 is of the electrical resistance type and is adapted to be connected via wire 32 and plug 34 to a conventional electrical outlet (not shown). An indicator light 36 is included in the circuit and is visible through a window 38 in the housing. Light 36 provides a means of visually indicating when the heater is energized.

When energized, the heater raises the temperature of the platen 30 and the nose 12 of an anchoring device in contact therewith to melt the adhesive coating 14 preparatory to pressing the nose of the fastening device against a support surface. This results in the anchoring device becoming bonded to the support surface, as shown for example in Figure 5.

As can best be seen in Figure 3, the maximum width dimension "W" of the head portion 20a between the side walls 24 is less than the diameter "D" of the circular rim 18 on the anchoring device 10. Thus, when the anchoring device is mounted on the platen 30, portions of the rim 18 protrude laterally beyond the side walls 24, such laterally protruding portions being indicated in Figure 3 at 18'. These laterally protruding portions can be gripped between a user's fingers, thereby providing a convenient and safe means of handling the anchoring device without exposure to the heated platen 30.

In order to further enhance safety, the platen 30 is preferably recessed rearwardly of the plane "P" of the front wall 22 by a distance d_1 . Distance d_1 is less than the thickness of the nose portion 12. Thus, when the anchoring device is mounted on the platen, the nose portion protrudes forwardly beyond the plane P by a slight distance d_2 . Typically, d_1 will be 0.38mm (0.015") the thickness of the nose 12 will be 0.76mm (0.030"), thus making d_2 also approximately 0.38mm (0.015").

By locating the platen 30 slightly behind the plane P of the front wall 22, there is less likelihood of it being inadvertently contacted by the user. The slight forward protrusion of the nose 12 beyond the plane P enables the nose to be firmly pressed against a mounting surface to obtain secure bonding, with the remainder of the front wall 22 serving as a guide surface which resists cocking of the tool and thereby further enhances secure bonding.

As can be best seen in Figure 4, when the anchoring device is mounted on the platen 30, the

circular flange 18 is spaced forwardly from the base of the recess 26. This insures that there is intimate contact between the platen and the rear surface of the nose 12, thereby enhancing rapid and efficient heating.

Preferably, the side walls 24 are provided with vent openings indicated typically at 40. This allows ambient air to circulate freely through the head portion 20a.

As indicated in Figure 5, once the anchoring device 10 is securely bonded to a mounting surface, it serves as a base for removably supporting hooks or other like elements, as indicated for example by the broken lines at 42.

Various changes and modifications can be made to the embodiment herein chosen for purposes of disclosure without departing from the scope of the coverage provided by the claims appended hereto. Examples of such changes and modifications might include changing the configuration of the platen 30 to accommodate differently configured anchoring devices, elimination of the indicator light 36, heating the platen 30 by means other than an electrical resistance heater, etc.

Claims

1. A tool (20) for applying an anchoring device (10) to a support surface, the anchoring device having a forwardly protruding nose (12) carrying hot melt adhesive (14) and a rear recess surrounded by a circular rim (18), said tool (20) comprising:

a housing (20a, b: 24) having a head portion (20a);

a front wall (22) on said head portion (20a), with oppositely facing side walls (24) extending rearwardly therefrom, said front wall having forwardly protruding portions defining a front reference plane, with a front recess (26) in said front wall (22) located rearwardly of said front reference plane;

a heater (28) in said head portion (20a), said heater having a platen (30) protruding through said front wall (22) into said front recess (26), said front recess being dimensioned to removably receive one of the anchoring devices (10) on said platen (30), the dimensions of said front recess (26) and said platen (30) being such that the nose (12) of the thus received anchoring device protrudes forwardly beyond said front reference plane (P), with said platen (30) being dimensioned to protrude into the rear recess (16) of the thus received anchoring device (10) and into contact with the nose (12) hereof, said heater (28) being adapted to heat said platen (30) and the nose (12) of the anchoring device (10) in contact therewith



to melt said adhesive (14) preparatory to pressing the nose (12) of said anchoring device against said support surface.

2. The tool of claim 1 wherein said front recess (26) extends across the entire width (W) of said front wall (22); and the outer diameter (D) of the rim (18) on the anchoring device (10) is greater than the width (W) of said front wall (22), whereupon the rim (18, 18') of the thus received anchoring device protrudes laterally beyond the side walls (24) of said head portion (20a). 5
3. The tool of claim 1 wherein said platen (30) is located rearwardly of said front reference plane (P). 10
4. The tool of claim 1 wherein said head portion (20a) is provided with a maximum width dimension (W) between said side walls (24) which is less than the diameter (D) of the circular rim (18) of the anchoring device (10). 15
5. The tool of claim 1 wherein the extent to which said platen (30) protrudes forwardly from the bottom of said front recess (26) is greater than the depth of the rear recess (16) in the anchoring device (10), whereupon the rim (18) of the thus received anchoring device is spaced from the bottom of said front recess (26). 20
6. The tool of claim 3 wherein said distance (d₁) between said platen (30) and said front reference plane (P) is less than the thickness of said nose (12). 25
7. The tool of claim 1 wherein said housing (20a, 20b, 24) further includes a handle portion (20b) extending rearwardly from said head portion (20a), and wherein said heater (28) is electrically energized by electrical power supply conduit means (32, 34, 36, 38) extending through said handle portion (20b). 30
8. The tool of claim 7 wherein said conduit means includes an indicator light (36) visible through a window (38) in said housing. 35
9. The tool of claim 1 further comprising vent openings (40) in said side walls (24) for allowing ambient air to circulate through said head portion (20a). 40

Patentansprüche

1. Werkzeug (20) zum Anbringen eines Befestigungselements (10) an einer Tragfläche, wobei

das Befestigungselement eine vorwärts abstehende Nase (12) mit einem aufgetragenen heißschmelzenden Klebemittel (14) und einen rückseitigen, durch einen kreisförmigen Rand (18) umgebenen Ausschnitt aufweist, wobei das Werkzeug (20) umfaßt;

ein Gehäuse (20a, b; 24) mit einem Kopfabschnitt (20a);

eine Vorderwand (22) am Kopfabschnitt (20a) mit einander gegenüberliegenden Seitenwänden (24), welche sich von der Vorderwand rückwärtig erstrecken, wobei die Vorderwand einen nach vorne vorstehenden Bereich aufweist, welcher eine vordere Referenzebene bildet und einen vorderen Ausschnitt (26) in der Vorderwand (22) aufweist, der gegenüber der vorderen Referenzebene nach hinten versetzt ist;

ein Hezelement (28) in dem Kopfabschnitt (20a), welches eine durch die vordere Wand (22) in den vorderen Ausschnitt (26) hervorstehende Platte (30) aufweist, wobei der vordere Ausschnitt zur lösbaren Aufnahme eines Befestigungselements (10) auf der Platte (30) dimensioniert ist und die Dimensionen des vorderen Ausschnitts (26) und der Platte (30) so sind, daß die Nase (12) des auf diese Weise aufgenommenen Befestigungselements nach vorne über die vordere Referenzebene (P) hervorsteht, wobei die Platte (30) so dimensioniert ist, daß sie in den hinteren Ausschnitt (16) des aufgenommenen Befestigungselements (10) hervorsteht und mit dessen Nase (12) in Kontakt steht, wobei das Hezelement (28) zum Aufheizen der Platte (30) und der mit dieser in Kontakt stehenden Nase (12) des Befestigungselements (10) ausgebildet ist, um das Klebemittel (14) zur Vorbereitung eines Pressens der Nase (12) des Befestigungselements gegen die Tragfläche zu schmelzen.

2. Werkzeug nach Anspruch 1, dadurch gekennzeichnet, daß der vordere Ausschnitt (26) sich über die gesamte Breite (W) der vorderen Wand (22) erstreckt und der Außendurchmesser (D) des Randes (18) an dem Befestigungselement (10) größer als die Breite (W) der vorderen Wand (22) ist, wobei der Rand (18, 18') des folglich aufgenommenen Befestigungselements seitlich über die Seitenwände (24) des Kopfabschnitts (20a) übersteht.
3. Werkzeug nach Anspruch 1, dadurch gekennzeichnet, daß die Platte (30) gegenüber der vorderen Referenzebene (P) nach hinten versetzt ist.



4. Werkzeug nach Anspruch 1, dadurch gekennzeichnet, daß der Kopfabschnitt (20a) zwischen den Seitenwänden (24) eine maximale Breitenausdehnung aufweist, die geringer als der Durchmesser (D) des kreisförmigen Randes (18) des Befestigungselementes (10) ist.

5. Werkzeug nach Anspruch 1, dadurch gekennzeichnet, daß das Maß, um das die Platte (30) nach vorne vom Boden des vorderen Ausschnitts (26) vorsteht, größer als die Tiefe des hinteren Ausschnitts (16) des Befestigungselementes (10) ist, wodurch der Rand (18) des aufgenommenen Befestigungselementes vom Boden des vorderen Ausschnitts (26) beabstandet ist.

6. Werkzeug nach Anspruch 3, dadurch gekennzeichnet, daß die Entfernung (d₁) zwischen der Platte (30) und der vorderen Referenzebene (P) geringer als die Dicke der Nase (12) ist.

7. Werkzeug nach Anspruch 1, dadurch gekennzeichnet, daß das Gehäuse (20a, 20b, 24) weiterhin einen Handabschnitt (20b) aufweist, welcher sich vom Kopfabschnitt (20a) rückseitig erstreckt und wobei das Heizelement (28) durch eine elektrische Leitungsvorrichtung (32, 34, 38) elektrisch versorgt wird, welche sich durch den Handabschnitt (20b) erstreckt.

8. Werkzeug nach Anspruch 7, dadurch gekennzeichnet, daß die Leitungseinrichtung eine Anzeigelampe (36) aufweist, die durch ein Fenster (38) des Gehäuses sichtbar ist.

9. Werkzeug nach Anspruch 1, gekennzeichnet durch Belüftungsöffnungen (40) in den Seitenwänden (24) zur Zirkulation von Umgebungsluft durch den Kopfabschnitt (20a).

Revendications

1. Outil (20) pour appliquer un dispositif de fixation (10) sur une surface de support, le dispositif de fixation présentant un bec (12) saillant vers l'avant, supportant une colle (14) fondant à haute température et une cavité arrière entourée par un rebord circulaire (18), ledit outil (20) comprenant :

un boîtier (20a, 20b; 24) présentant une partie de tête (20a),

une paroi avant (22) située sur ladite partie de tête (20a), des parois latérales (24) opposées s'étendant vers l'arrière de cette dernière,

ladite paroi avant présentant des parties saillantes vers l'avant, définissant un plan de référence avant, une cavité avant (26) ménagée dans ladite paroi avant (22) étant située à l'arrière dudit plan de référence avant;

un élément de chauffage (28) situé dans ladite partie de tête (20a), ledit élément chauffant présentant un plateau (30) saillant de la paroi avant (22), pour aller dans ladite cavité avant (26), ladite cavité avant étant dimensionnée de façon à loger de manière amovible l'un des dispositifs de fixation (10) situés sur ledit plateau (30), les dimensions de ladite cavité avant (26) et dudit plateau (30) étant telles que le bec (12) du dispositif de fixation ainsi logé fait saillie vers l'avant, au-delà dudit plan de référence avant (P), ledit plateau (30) étant dimensionné de manière à faire saillie dans la cavité arrière du dispositif de fixation (10) ainsi logé et en contact avec son bec (12), ledit élément chauffant (28) étant adapté pour chauffer ledit plateau (30) et le bec du dispositif de fixation (10) en contact avec ce dernier, pour faire fondre ladite colle (14) avant de presser le bec (12) dudit dispositif de fixation contre ladite surface de support.

2. Outil selon la revendication 1, dans lequel ladite cavité avant (26) s'étend sur toute la largeur (W) de ladite paroi avant (22) et le diamètre extérieur (D) du rebord (18) situé sur le dispositif de fixation (10) est supérieur à la largeur de ladite paroi avant (22), à la suite de quoi le rebord (18, 18') du dispositif de fixation ainsi logé fait saillie latéralement au-delà des parois latérales (24) de ladite partie de tête (20a).

3. Outil selon la revendication 1, dans lequel ledit plateau (30) est situé à l'arrière dudit plan de référence avant (P).

4. Outil selon la revendication 1, dans lequel ladite partie de tête (20a) est dotée d'une dimension de largeur (W) maximale entre lesdites parois latérales (24), qui est inférieure au diamètre (D) du rebord circulaire (18) du dispositif de fixation (10).

5. Outil selon la revendication 1, dans lequel la distance sur laquelle ledit plateau (30) fait saillie vers l'avant depuis le fond de ladite cavité avant (26) est supérieure à la profondeur de la cavité arrière (16) ménagée dans le dispositif de fixation (10), à la suite de quoi le rebord (18) du dispositif de fixation ainsi logé est espacé du fond de ladite cavité avant (26).



6. Outil selon la revendication 3, dans lequel ladite distance (d1) entre ledit plateau (30) et ledit plan de référence avant (P) est inférieure à l'épaisseur dudit bec (12).

7. Outil selon la revendication 1, dans lequel ledit boîtier (20a, 20b, 24) comprend en outre une partie de poignée (20b) s'étendant vers l'arrière de ladite partie de tête (20a) et dans lequel ledit élément chauffant (28) est activé électriquement par un moyen de conduction d'alimentation en puissance électrique (32, 34, 36, 38), s'étendant dans ladite partie de poignée (20b).

8. Outil selon la revendication 7, dans lequel ledit moyen de conduction comprend une lumière indicatrice (36) visible à travers une fenêtre (38) ménagée dans ledit boîtier.

9. Outil selon la revendication 1, comprenant en outre des ouvertures d'évent (40) ménagées dans lesdites parois latérales (24), pour permettre à de l'air ambiant de circuler dans ladite partie de tête (20a).

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