

PATENT SPECIFICATION

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(54) TIP ASSEMBLIES FOR THERMAL PRESSES

(71) We, YARDLEY PRODUCTS CORPORATION, of 10 W. College Avenue, Yardley, Pennsylvania, United States of America, a Corporation organized and existing under the laws of the State of Pennsylvania, United States of America, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to tip assemblies for use with thermal presses. Such assemblies are employed with thermal presses and used to place inserts of hard material by forcibly pressing the inserts into bases of softer materials.

Metallic inserts are often embedded in a variety of plastics materials in order to afford a means for receiving mating fastener elements. For this purpose, cylindrical inserts are often provided with threaded bores such that when the insert is embedded in a recess formed in the surface of a plastics workpiece it will provide a hole or recess therein having metallic internal threads which are adapted to receive threads from a complementary male fastener element.

In order to insert such metallic inserts into base materials, it is desirable to utilize a thermal press which will heat the metallic insert in order to aid in the embedding and the gripping of the insert into the softer base material. The base material may be a plastics material or other material softer than the metal of the insert. For example, the base material may be wood, aluminium or any other relatively soft material.

The present invention is particularly concerned with tip assemblies for presses which achieve the two-fold purpose of, firstly, heating a metallic insert prior to insertion and, secondly, performing the act of insertion of the metallic insert into the surface of a softer base material.

The use of thermal presses is well known for the placement of metallic inserts into softer base materials. However, to achieve this desired end the thermal presses utilized

heretofore have been suitable only for individual hand-operated insertions. In order to utilize such a thermal press for repeated insertions such as is required in normal assembly jobs, a means must be found to closely control the heat in the tip element of the head of the thermal press. There are two main problems which work against one another, and no thermal press utilized heretofore has solved each of these problems. The first problem is the accumulation of excessive heat in the tip element which may distort or overheat the softer base material and as such not achieve a firm inter-connection between the insert and the base material. The second problem working in opposition to the first problem is the lack of generation of sufficient heat in the tip element and the consequential lack of generation of sufficient heat in the insert itself in order to sufficiently displace the base material during the process of insertion.

These problems work in opposition to one another during cyclical operation of the thermal press in assembly line operations. The usual problem is the accumulation of excessive amounts of heat in the tip element and the invention is concerned with tackling this problem.

According to the invention there is provided a tip assembly for use with a thermal press, the assembly comprising:

- a) an elongate core member formed of thermally conductive material;
- b) a tip element adapted to be securely held at one end of the core member;
- c) heating means held by the core member and positioned adjacent the tip element to heat the tip element; and
- d) heat dissipation means positioned around the core member to facilitate dissipation of heat from the tip element and the core member, the heat dissipation means including a plurality of spaced fins the outer envelope of which, at least at the end of the heat dissipation means nearer said one end of the core member, converges in a direction towards said one end of the core member.

Preferably, the outer envelope converges in a generally paraboloidal shape, a term

WHAT WE CLAIM IS:—

1. A tip assembly for use with a thermal press, the assembly comprising:
- 5 a) an elongate core member formed of thermally conductive material;
 - b) a tip element adapted to be securely held at one end of the core member;
 - 10 c) heating means held by the core member and positioned adjacent the tip element to heat the tip element; and
 - d) heat dissipation means positioned around the core member to facilitate dissipation of heat from the tip element and the core member, the heat dissipation means including a plurality of spaced fins the outer envelope of which, at least at the end of the heat dissipation means nearer said one end of the core member, converges in a direction towards said one end of the core member.
2. A tip assembly according to Claim 1, wherein the outer envelope converges in a conforming substantially to a paraboloid of revolution shape.
3. A tip assembly according to Claim 1 or Claim 2, wherein the tip element comprises a protruding finger member which is disposed at the extremity of the tip element and which projects from a paraboloidal section, whereby to facilitate heat flow from the heating means to the finger member.
4. A tip assembly according to any one of the preceding claims, wherein the heating means comprises an electrical resistance heating element.
5. A tip assembly according to any one of the preceding claims, wherein the core member is tubular and accommodates the heating element therein and receives the tip element in said one end thereof.
- 40 6. A tip assembly according to any one of the preceding claims, wherein the heat dissipation means is movable along the core member to vary the relative position between the heat dissipation means and the core member, heating means and tip element.
- 45 7. A tip assembly according to Claim 1, wherein said one end of the core member is female threaded and the tip element is male threaded with a co-operating thread to provide a means of securely holding the tip element on said one end of the core member.
8. A tip assembly according to any one of the preceding claims as appendant to Claim 2, wherein the fins are annular and of gradually increasing radius in a direction away from said one end of the core member.
9. A tip assembly according to any one of the preceding claims, wherein the core member holds the heating means and the tip element in abutment to ensure effective thermal transmission therebetween.
10. A tip assembly for use with a thermal press, the assembly comprising:
- 65 a) a longitudinally extending hollow tubular core member formed of thermally conductive material;
 - b) a tip element adapted to be securely held within one end of said core member and to be heated by the thermal press, the tip element including an outwardly extending finger member and a paraboloidal section to concentrate heat flow to the finger member;
 - 75 c) an electrical resistance heating means held by said core means and positioned adjacent the tip element selectively to cause heating thereof; and
 - d) heat dissipation means positioned around the core member to facilitate dissipation of heat from the tip element and the core member, the heat dissipation means including a plurality of outwardly extending annular discs forming an envelope having the shape of a paraboloid of revolution, converging towards said one end of the core member, to facilitate dissipation of heat from the tip assembly.
11. A tip assembly for a thermal press, the assembly being constructed and arranged substantially as herein particularly described with reference to the accompanying drawings.

HUSTWITT & CO.,
Chartered Patent Agents,
Ludgate House,
110 Fleet Street,
London, EC4A 2AB.

