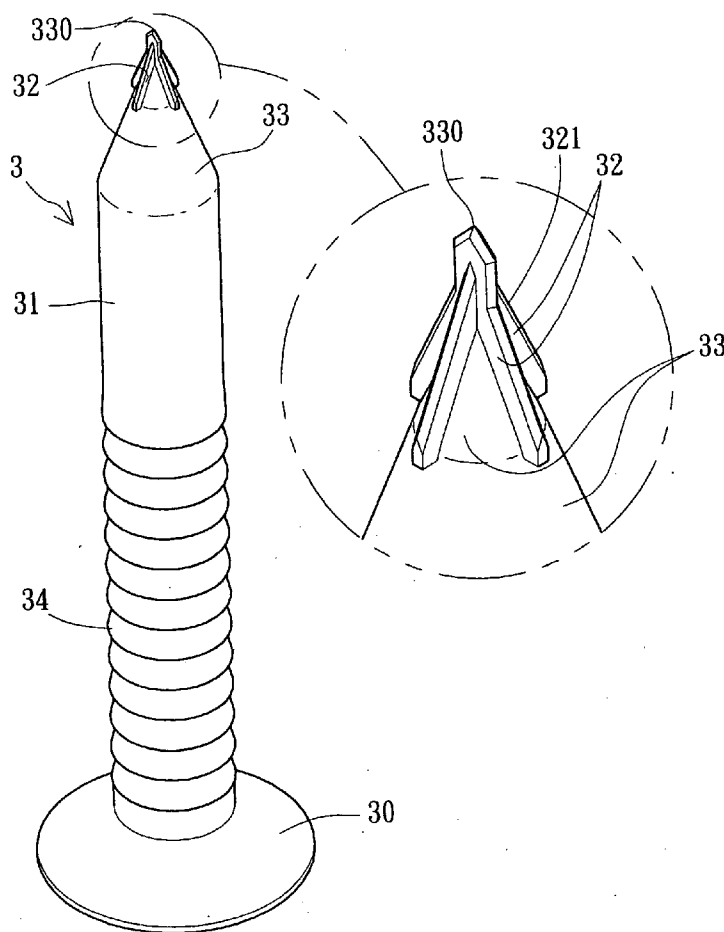




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(19) **United States**(12) **Patent Application Publication**
Lee(10) **Pub. No.: US 2006/0234801 A1**(43) **Pub. Date: Oct. 19, 2006**(54) **NAIL WITH WINGS ON TIP****Publication Classification**(75) Inventor: **Yi Kuan Lee**, Da-Li City (TW)(51) **Int. Cl.****B21G 3/00** (2006.01)(52) **U.S. Cl.** **470/34**Correspondence Address:
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NEW YORK, NY 10038 (US)(57) **ABSTRACT**(73) Assignee: **Samson Power Tool Co., Ltd.**(21) Appl. No.: **11/363,876**(22) Filed: **Feb. 27, 2006**(30) **Foreign Application Priority Data**Mar. 31, 2005 (TW)..... 094110381
Apr. 22, 2005 (TW)..... 094112976

A nail includes a head, a shank connected to the head and a plurality of threads defined in an outer periphery of the shank, a tip portion connected to an end of the shank, and a plurality of wings extending from the tip portion. The tip of the tip portion first penetrates through the object and the wings cut through the board and form a plurality of parts in an inner periphery of a hole into which the nail penetrates. The nail penetrates and moves through the object linearly. The threads are engaged with the parts so that the nail is firmly engaged with the board.



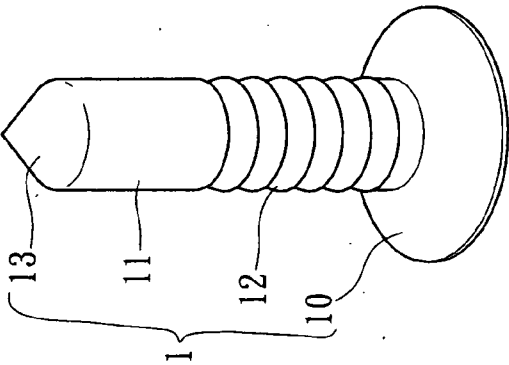


FIG 1
PRIOR ART

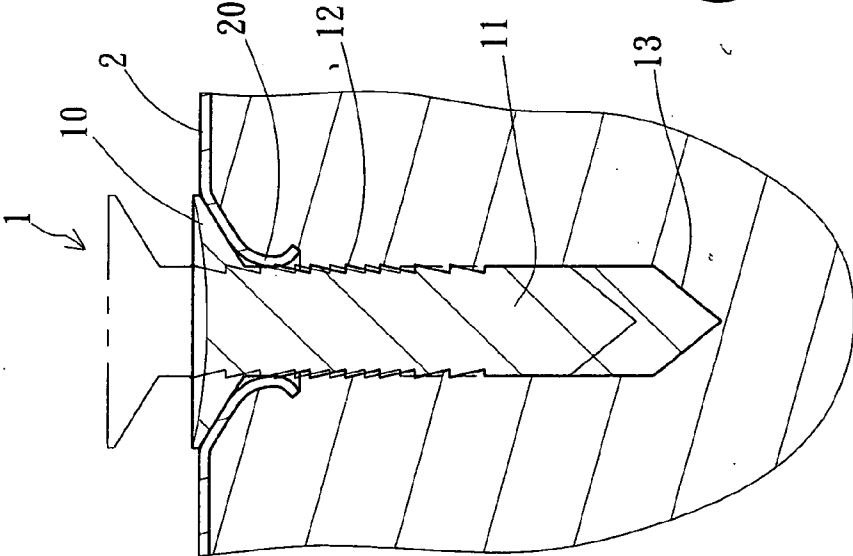


FIG 2
PRIOR ART

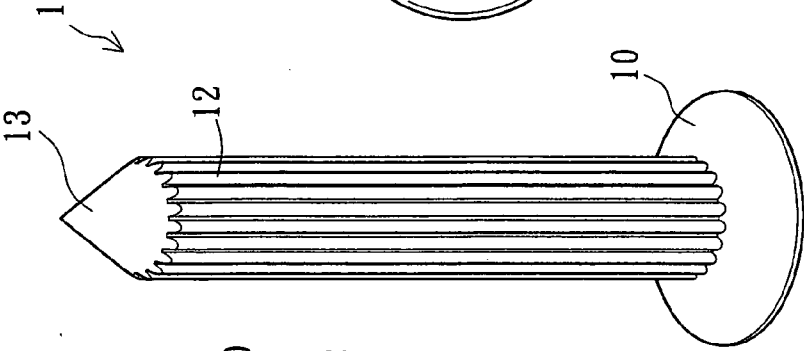


FIG 3
PRIOR ART

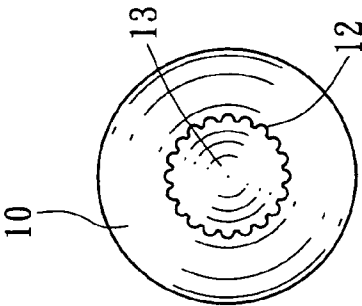
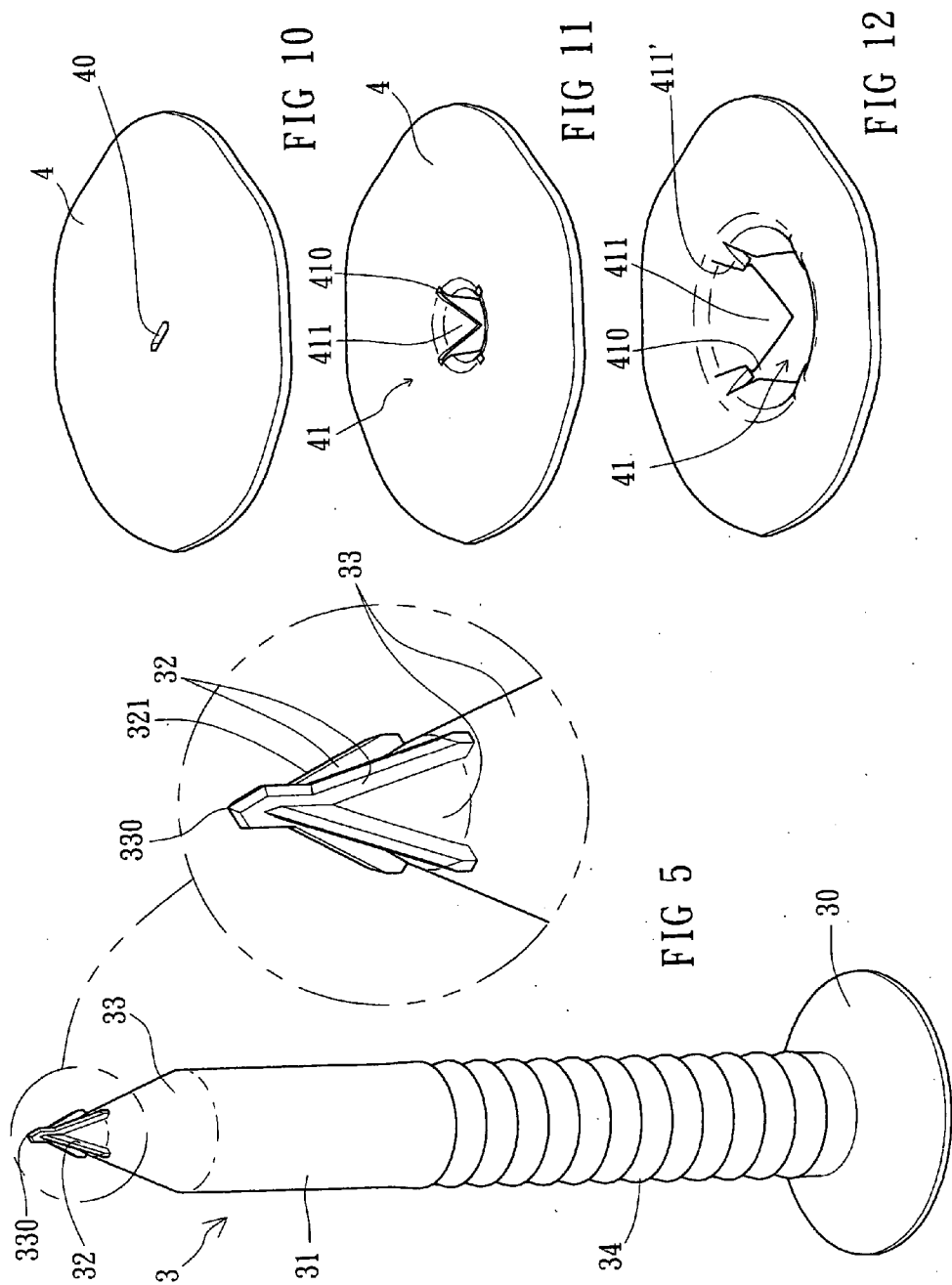
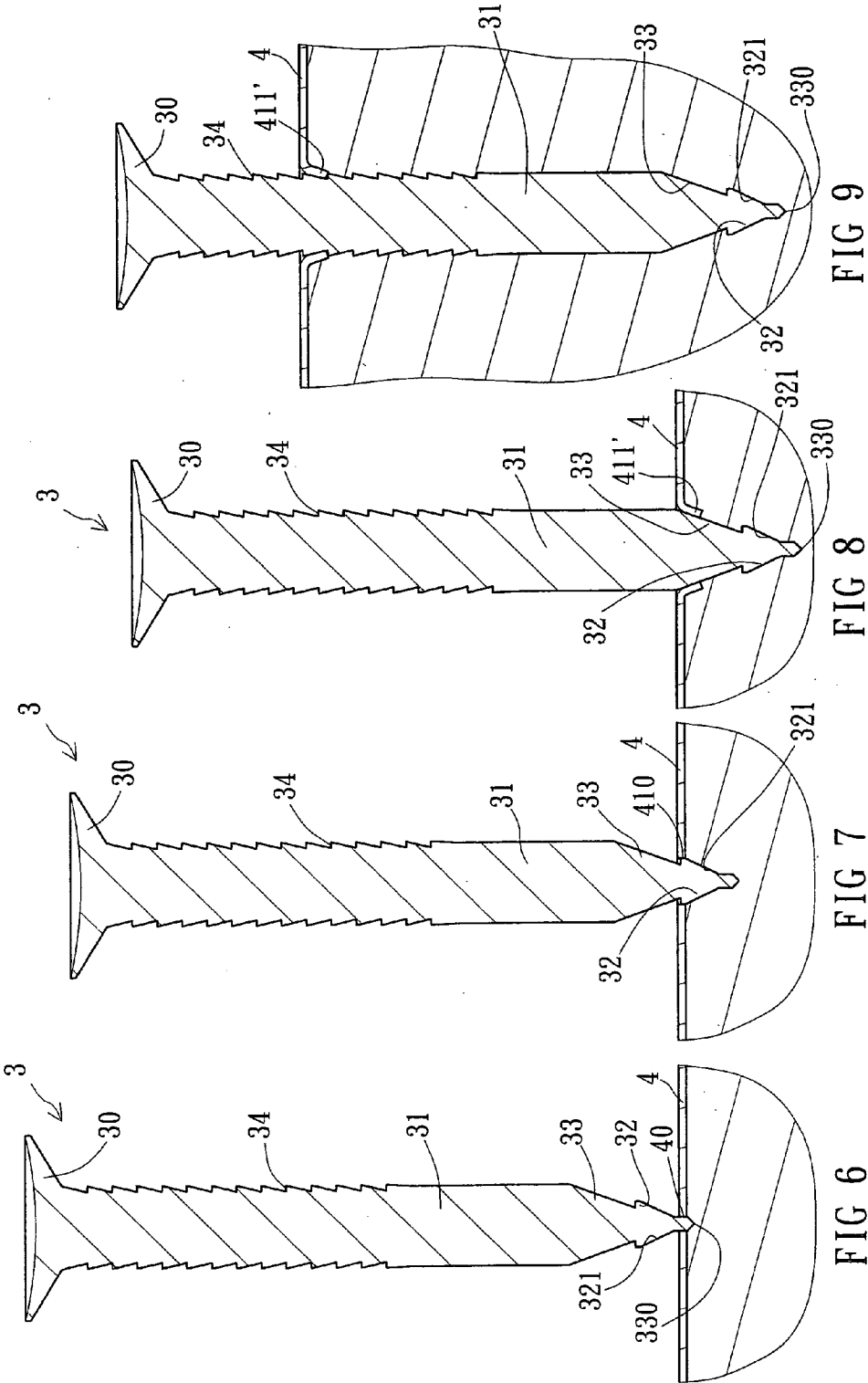


FIG 4
PRIOR ART





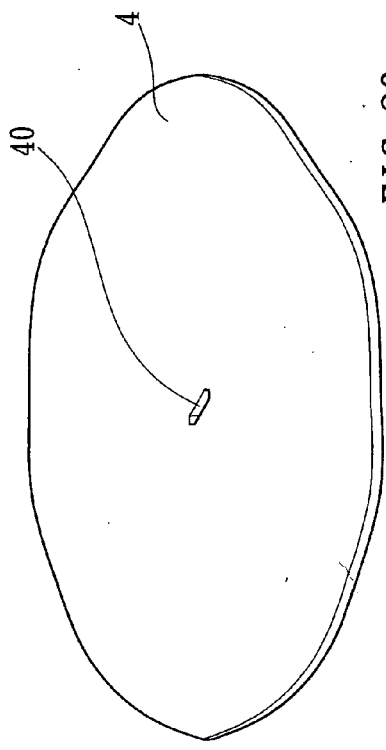
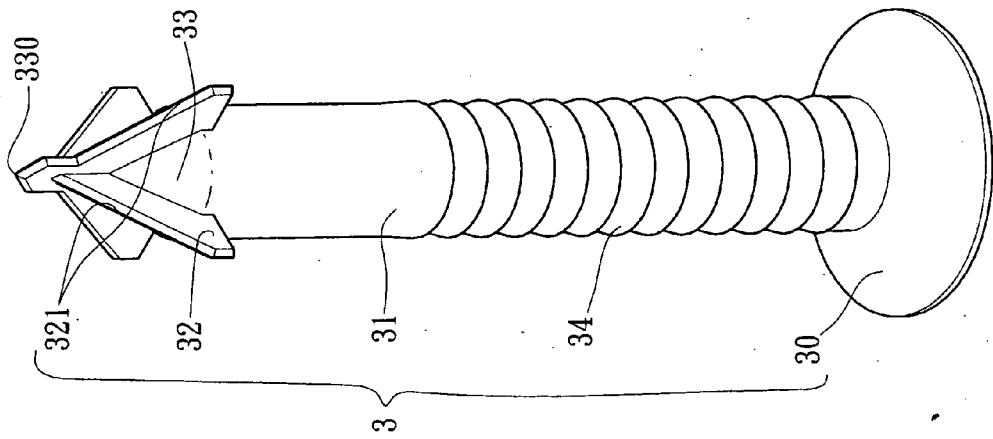


FIG 20

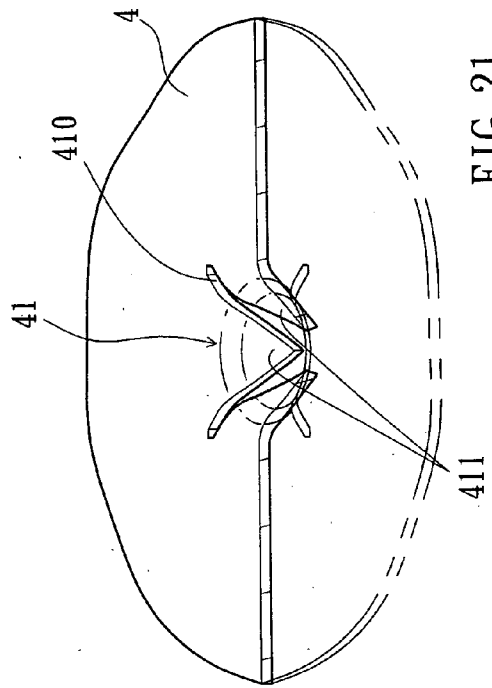
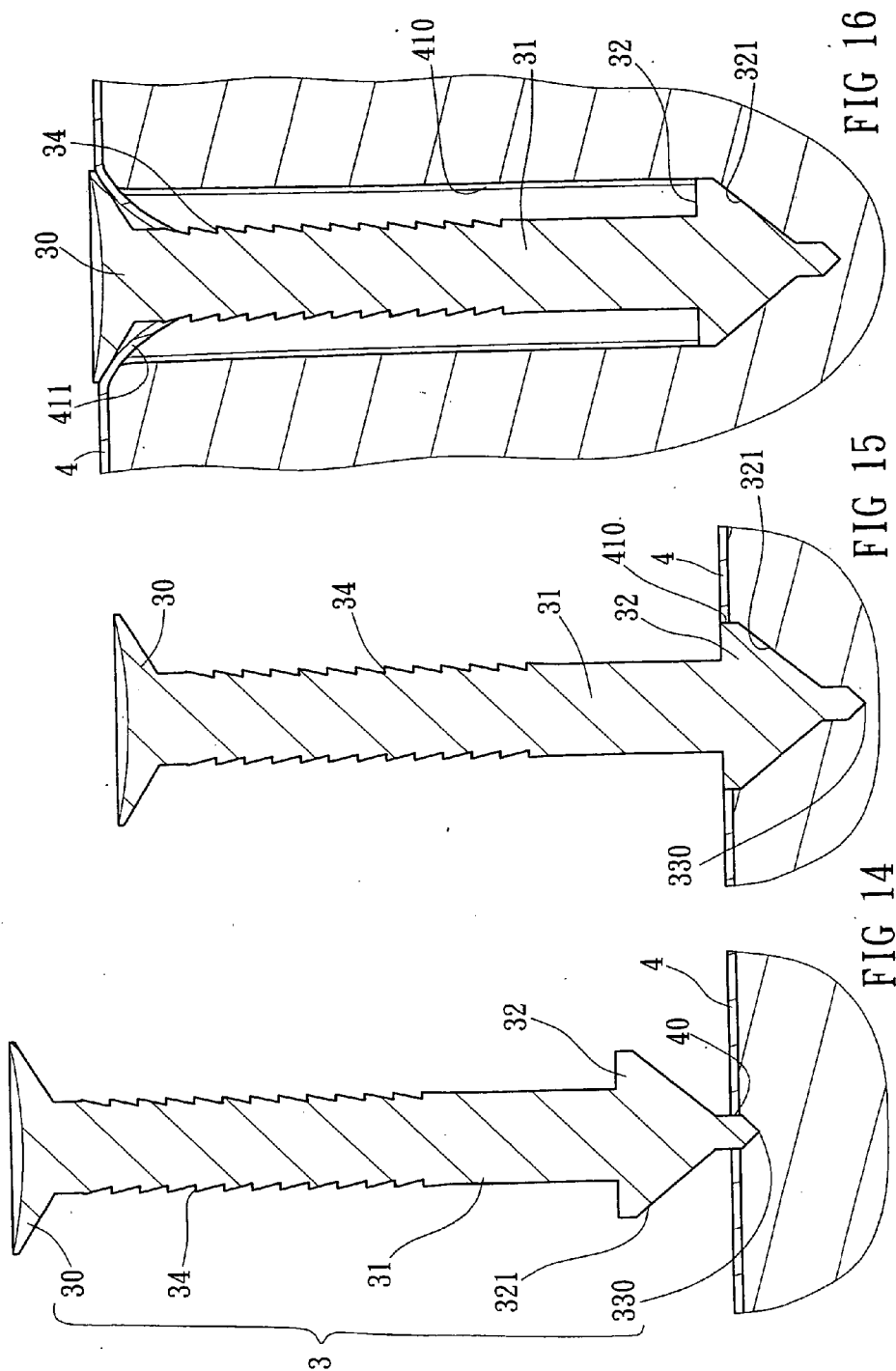
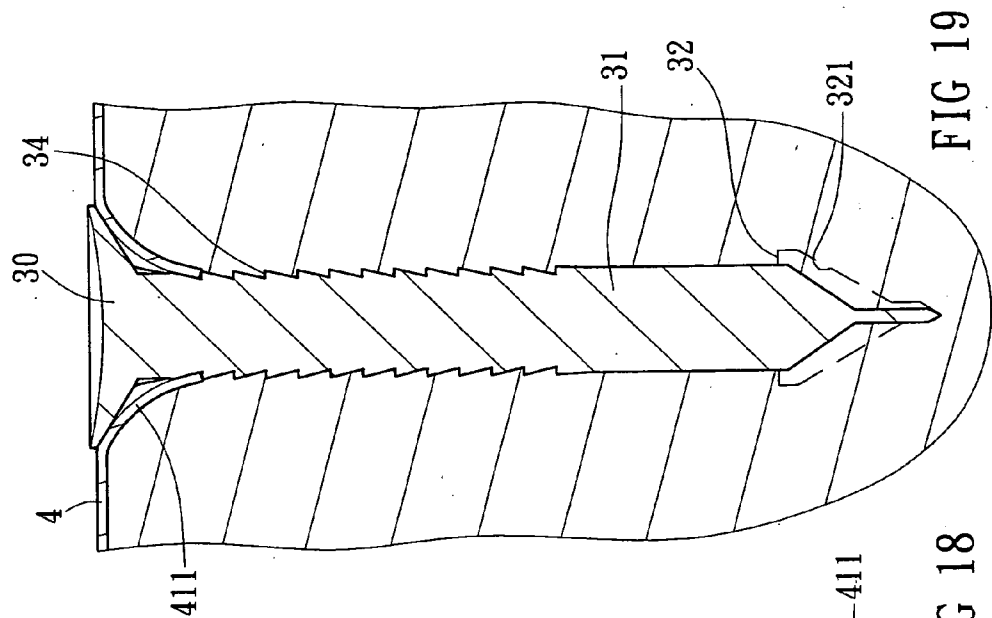
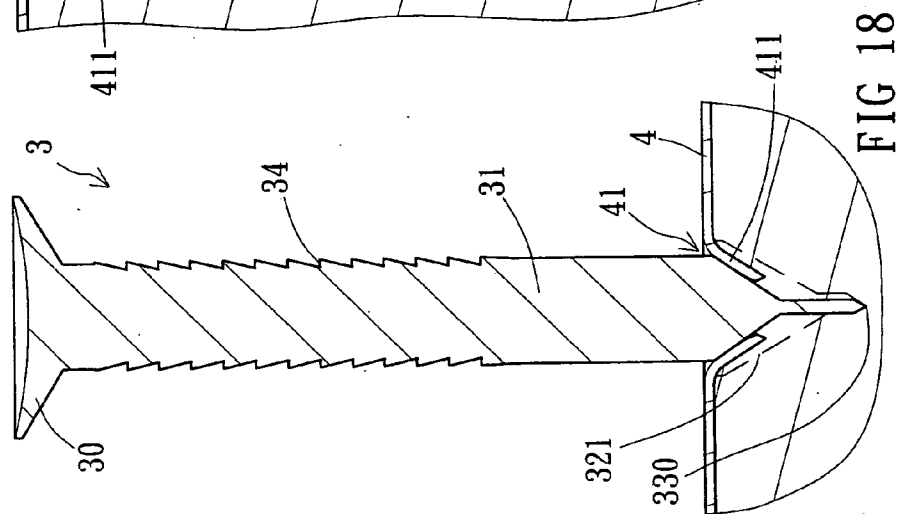
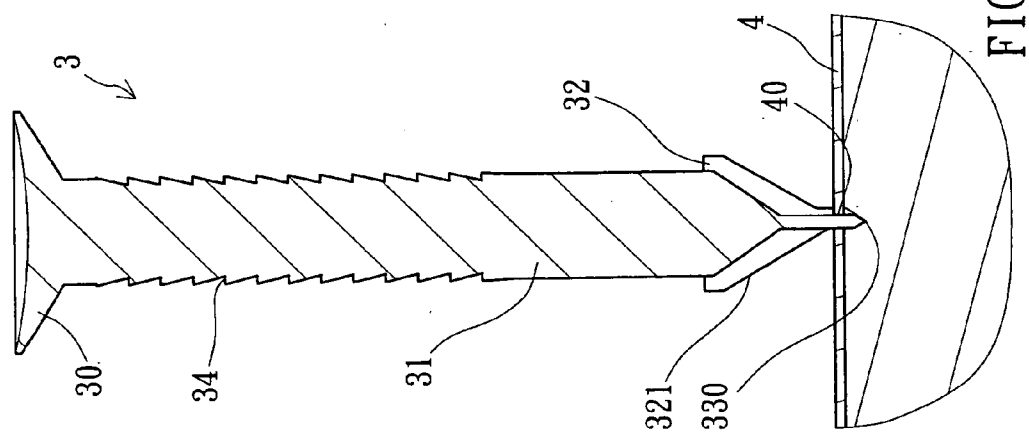


FIG 21

FIG 13





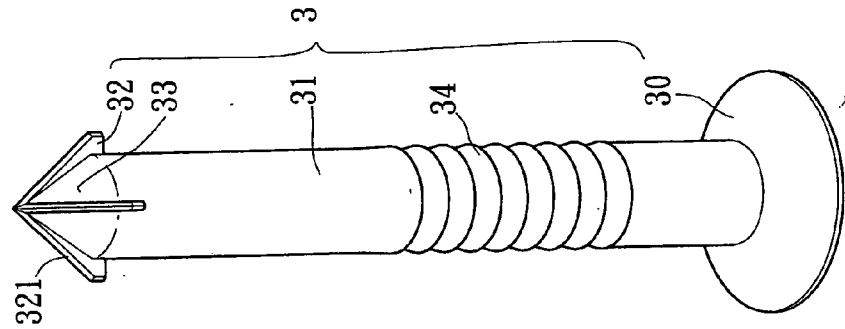


FIG 25

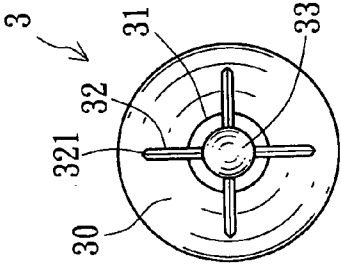


FIG 24

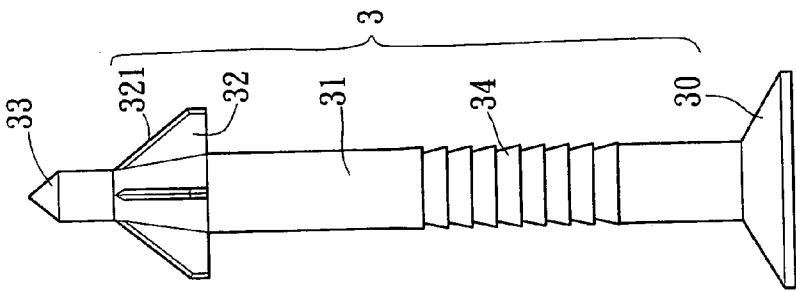


FIG 23

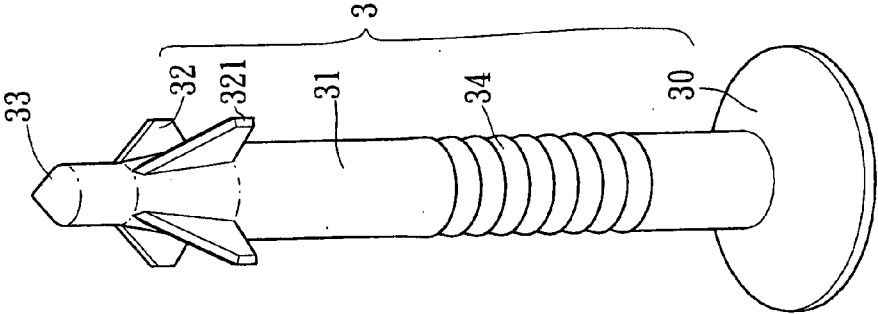


FIG 22

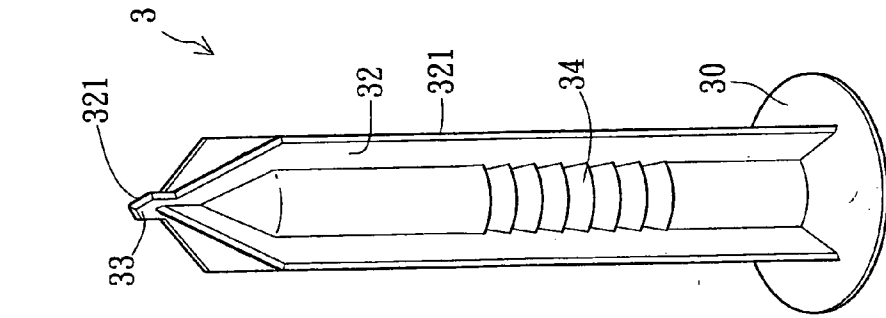


FIG 26

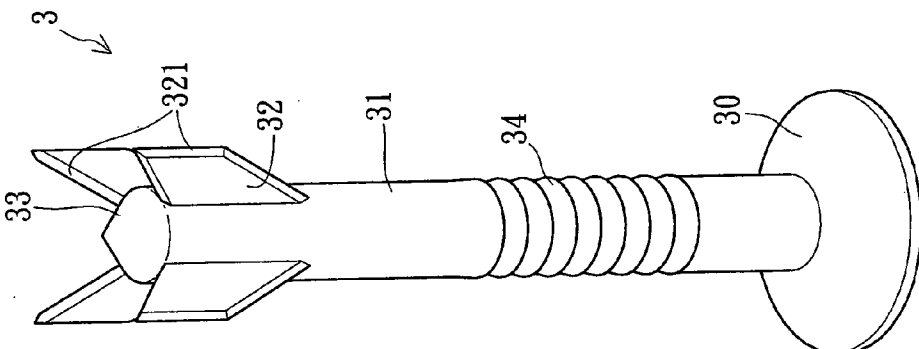


FIG 27

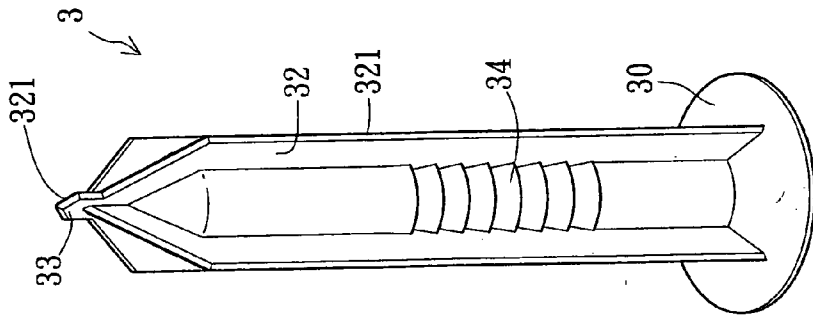


FIG 28

NAIL WITH WINGS ON TIP

FIELD OF THE INVENTION

[0001] The present invention relates to a nail that includes wings on tip so as to easily cut into object and the split portions made by the separation of the tip and wings are engaged with threads of the nail.

BACKGROUND OF THE INVENTION

[0002] A conventional nail 1 is shown in FIGS. 1 to 4 and generally includes a head 10, a shank 11 connected to the head 10, a plurality of threads 12 on the shank 11, and a tip 13 which is located at an end of the shank 11 and opposite to the head 10. The threads 12 are defined spirally in an outer surface of the shank 11. The threads 12 can also be replaced by axial ridges as disclosed in FIG. 3. When the nail 1 penetrates into the board 2, the tip 13 which is a conical tip, makes a hole 20 through the board 2 and the periphery of the hole 20 is torn till the shank 11 is engaged with the hole 20 and the underside of the head 10 is in contact with the surface of the board 2 as shown in FIG. 2.

[0003] It is noted that the periphery of the hole 20 is torn and curves outward so that the inner diameter of the torn parts of the inner periphery of the hole 20 is larger than the outer diameter of the shank 11, so that there is gaps between the inner periphery of the hole 20 and the outer diameter of the shank 11. In other words, the nail 1 is not well secured in the board 2 and can be easily pulled out from the board 2.

[0004] The present invention intends to provide a nail that is firmly engaged with the inner periphery of the hole through which the nail penetrates.

SUMMARY OF THE INVENTION

[0005] The present invention relates to a nail that comprises a head, a shank connected to the head, a plurality of threads defined in an outer periphery of the shank, a tip portion connected to an end of the shank, and a plurality of wings extending from the tip portion. The threads are located between the head and the wings. The nail penetrates through an object and moves linearly. The wings cut through the board and form a plurality of parts in an inner periphery of a hole through which the nail penetrates in the board. The threads are engaged with the parts.

[0006] The primary object of the present invention is to provide a nail that is firmly engaged with the parts cut from the inner periphery of the hole through which the nail penetrates.

[0007] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 shows a conventional nail;

[0009] FIG. 2 is a cross sectional view to show the conventional nail penetrates into the board;

[0010] FIG. 3 shows another conventional nail;

[0011] FIG. 4 shows an end view of the conventional nail in FIG. 3;

[0012] FIG. 5 shows the nail of the present invention;

[0013] FIGS. 6 to 9 shows continuous actions of the nail of the present invention penetrates through the board;

[0014] FIG. 10 shows the board is first cut by the tip of the tip portion of the nail;

[0015] FIG. 11 shows a plurality of parts in the inner periphery of the hole in the board are defined by the wings;

[0016] FIG. 12 shows that two sides of each part in FIG. 11 are further cut by the parts;

[0017] FIG. 13 shows another embodiment of the nail of the present invention;

[0018] FIGS. 14 to 16 show continuous actions of the nail in FIG. 13 penetrates through the board;

[0019] FIGS. 17 to 19 show another angle of continuous actions of the nail in FIG. 13 penetrates through the board;

[0020] FIG. 20 shows the board is first cut by the tip portion of the nail in FIG. 13;

[0021] FIG. 21 shows the inner periphery of the hole in the board is cut by the wings of the nail in FIG. 13;

[0022] FIG. 22 is a perspective view to show yet another embodiment of the nail of the present invention;

[0023] FIG. 23 is a side view to show the nail of the present invention in FIG. 22;

[0024] FIG. 24 is an end view of the nail in FIG. 22;

[0025] FIG. 25 shows a further embodiment of the nail of the present invention, and

[0026] FIGS. 26 to 28 respectively show three different embodiments of the nail of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0027] Referring to FIGS. 5 to 9, the nail 3 of the present invention comprises a head 30, a cylindrical shank 31 connected to the head 30, a plurality of threads 34 defined in an outer periphery of the shank 31, a cone-shaped tip portion 33 connected to an end of the shank 31, and a plurality of wings 32 extending from the tip portion 33. The threads 34 are located between the head 30 and the wings 32, and each of the wings 32 has a cutting edge 321. The tip portion 33 is an elongate flat portion and the wings 32 are located at a distance from a tip 330 of the tip portion 33. The wings 32 extend outward from a tip 330 of the tip portion 33 and an outer diameter of two diagonally located wings 32 is smaller than an outer diameter of the shank 31.

[0028] As shown in FIGS. 6 to 12, when penetrating the nail through a board 4, the tip 330 of the tip portion 33 first cuts into the board 4 to form a slot 40 as shown in FIGS. 6 and 10, and then the wings 32 cut into the board 4 as shown in FIGS. 7 and 11. The wings 32 cut the inner periphery of the hole 41 in the board into four slits 410 and four parts 411 which extend downward. Further referring to FIGS. 8 and 12, the nail 3 is then moved linearly into the board 4 to let the cone-shaped tip portion 33 penetrate through the board 4, the slits 410 are further extended by the larger diameter of

the tip portion 33 and the shank 31 so as to form two short recesses 411' in two sides of each part 411. The nail 3 is continuously penetrated through the board 4 linearly and the parts 411 and the insides of the recesses 411' are engaged with the threads 34 to firmly grasp the nail 3. It is noted that the parts 411 do not curve outward so that the shank 31 of the nail 3 is snugly engaged with the hole 41. This nail 3 ensures that the nail 3 is not easily to be pulled from the board 4.

[0029] FIG. 13 shows another embodiment of the nail 3 wherein the only difference from that of FIG. 5 is that the outer diameter of two diagonally located wings 32 is larger than an outer diameter of the shank 31. Referring to FIGS. 14 to 21, when penetrating the nail 3 into the board 4, the wider wings 32 cut the inner periphery of the hole 41 to have four long slits 410 between four parts 411, and the four parts 411 are engaged with the threads 34 of the nail 3.

[0030] FIGS. 22 to 24 show yet another embodiment of the nail 3 wherein the tip portion 33 is a cylindrical section with a cone-shaped tip and the wings 32 extend outward from the cylindrical section and an outer diameter of two diagonally located wings 32 is larger than an outer diameter of the shank 31. FIG. 25 shows a further embodiment of the nail 3 wherein the wings 32 extend from the tip of the tip portion 33 and an outer diameter of two diagonally located wings 32 is larger than an outer diameter of the shank 31.

[0031] All the wings 32 of the previous embodiments each include a cutting edge 321 that a downward slope which slopes toward the head 30 of the nail 3.

[0032] FIGS. 26 and 27 show two embodiments wherein the wings 32 cutting edges 321 of wings 32 each have an upward slope which slopes away from the head 30.

[0033] FIG. 28 shows that the wings 32 extend continuously from the tip portion 32 and the shank 31 and are connected to an underside of the head 30.

[0034] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A nail comprising:

a head, a shank connected to the head, a plurality of threads defined in an outer periphery of the shank, a tip portion connected to an end of the shank, a plurality of wings extending from the tip portion, the threads located between the head and the wings, the nail adapted to penetrate through an object and moving linearly, the wings adapted to cut through the board and

to form a plurality of parts in an inner periphery of a hole in the board, the threads adapted to be engaged with the parts.

2. The nail as claimed in claim 1, wherein each of the wings has a cutting edge.

3. The nail as claimed in claim 1, wherein the tip portion is an elongate flat portion.

4. The nail as claimed in claim 1, wherein the wings are located at a distance from a tip of the tip portion.

5. The nail as claimed in claim 1, wherein the wings extend outward from a tip of the tip portion.

6. The nail as claimed in claim 1, wherein an outer diameter of two diagonally located wings is smaller than an outer diameter of the shank.

7. The nail as claimed in claim 1, wherein an outer diameter of two diagonally located wings is larger than an outer diameter of the shank.

8. A nail comprising:

a head, a shank connected to the head, a plurality of threads defined in an outer periphery of the shank, a tip portion connected to an end of the shank, a plurality of wings extending from the shank, the threads located between the head and the wings, the nail adapted to penetrate through an object and moving linearly, the wings adapted to cut through the board and to form a plurality of parts in an inner periphery of a hole in the board, the threads adapted to be engaged with the parts.

9. The nail as claimed in claim 8, wherein each of the wings has a cutting edge.

10. The nail as claimed in claim 8, wherein the wings are located at a distance from a tip of the tip portion.

11. The nail as claimed in claim 8, wherein the wings extend outward from a tip of the tip portion.

12. The nail as claimed in claim 8, wherein an outer diameter of two diagonally located wings is larger than an outer diameter of the shank.

13. A nail comprising:

a head, a shank connected to the head, a plurality of threads defined in an outer periphery of the shank, a tip portion connected to an end of the shank, a plurality of continuous wings extending from the tip portion and the shank and being connected to an underside of the head, the nail adapted to penetrate through an object and moving linearly, the wings adapted to cut through the board and to form a plurality of parts in an inner periphery of a hole in the board, the threads adapted to be engaged with the parts.

14. The nail as claimed in claim 13, wherein each of the wings has a cutting edge.

* * * * *