

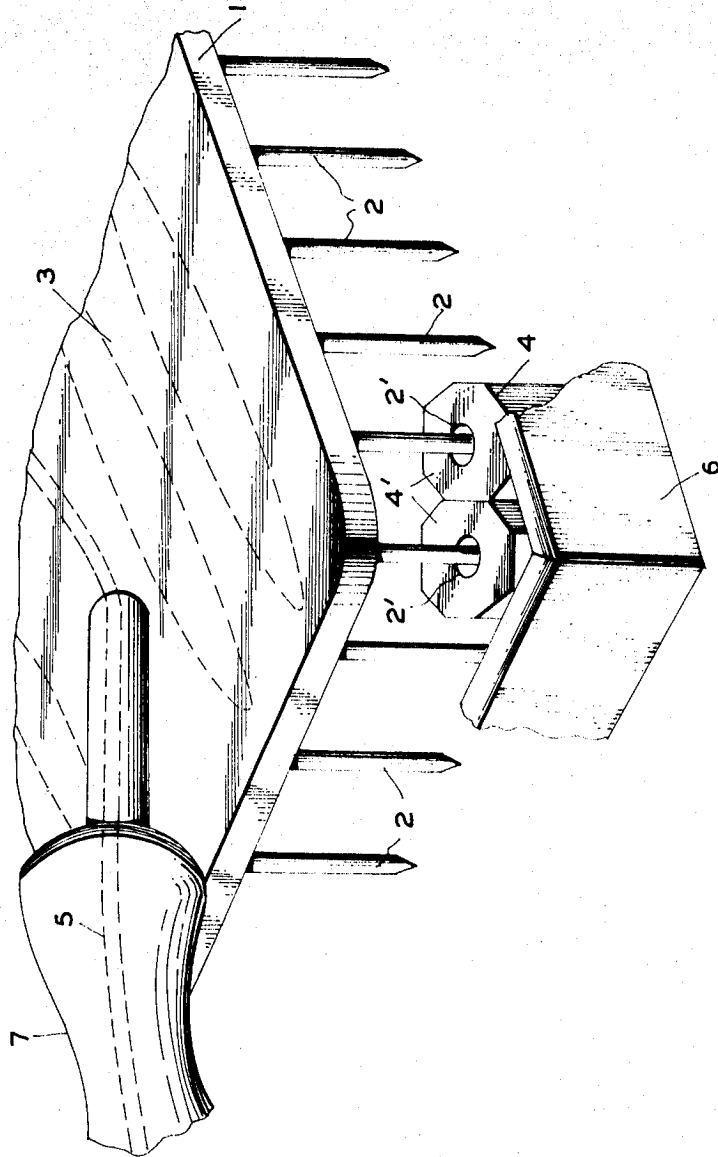
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HONEY-EXTRACTING METHOD AND APPARATUS

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**HONEY-EXTRACTING METHOD AND
 APPARATUS**

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3 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure involves the extraction of honey from wax-capped honey-filled honeycombs and the like with the aid of electrically heated probes and flat surfaces that automatically and rapidly remove the cap to expose the honey within the honeycomb cells.

The present invention relates to honey-extracting methods and apparatus, though it is also applicable elsewhere in situations involving similar problems.

The art has struggled for many years to find a rapid and facile technique for removing the wax capping that bees produce to cover over the honey-filled cells of their honeycombs, thus to expose the honey so that it can be extracted. The substantially universal apparatus used today is a cleaving blade or knife for longitudinally slicing off the substantially planar wax capping layer, such knives often being electrically heated to aid in this process. Though widely used, this technique has many drawbacks that, up to the present invention, simply have had to be endured by honey manufacturers. Among these difficulties are the inherent destruction of parts of the comb cells (which requires the bees to repair the same before re-use), the removing of some honey as the cap is sliced (requiring elaborate separating and purifying steps to remove cap wax mixed in the honey), frequent damage to the peripheral portions of the wood or other frames bounding the honeycomb cells, and inability to uncover cells capped below the surface of the upper frame edges.

Though there have been proposals, particularly from abroad, to perforate the cap mechanically by an array of needles or the like, either in a flat or cylindrical array, these have not in practice resulted in satisfactory opening of the capped cells for rapid extraction of the honey and have thus not found commercial favor.

An object of the present invention, accordingly, is to provide a new and improved method of and apparatus for opening wax-capped honey-filled honeycombs and the like that, surprisingly, is not subject to a single one of the disadvantages with the prior-art techniques above-discussed; but that, to the contrary, enables rapid removal of the cap and exposure of the honey.

Other and further objects will be hereinafter pointed out and more particularly delineated in the appended claims.

In summary, however, the method underlying the invention involves substantially simultaneously piercing the capping covering a plurality of cells both mechanically and under heat to form apertures in the cell capping, thereupon heating, softening and at least partially combusting the portions of the capping surrounding said apertures, and simultaneously removing the softened and combusted capping portions to expose the honey-filled cells. Preferred details and apparatus are hereinafter set forth.

The invention will now be described with reference to the accompanying drawing, the single figure of which is a fragmentary isometric view illustrating a preferred embodiment.

Referring to the drawing, a flat-surfaced heat-conduct-

ing-and-radiating metal or similar panel member 1 is shown interiorly provided with heating strips or coils 3 or the like, energizable by electric currents fed by a power cord 5 passed through an insulating handle 7. Depending from the lower planar surface of the member 1 is a plurality of heat-conducting probes 2, as a metal, arranged in a two-dimensional array to correspond to the array of honeycomb cells 4 with which the invention is to be employed. The probes 2 transversely extend normal to the plane of the member 1, being connected thereto in heat-transfer relation (integrally or by welded or other connections), such that application of the apparatus 1-2 to, or removal from, a planar honeycomb structure 4, with its cells bounded by a wooden or other frame 6, can be effected, as a unit, by the handle 7.

In accordance with the discovery underlying the invention, the problems of inadequate piercing inherent in prior-art needle-puncturing proposals and the difficulties in trying to remove the capping even with a heated slicing blade or knife, are completely overcome. It has been found that the heated probes 2 should simultaneously be caused to effect mechanical sharp-point piercing of the wax capping 4' covering the plurality of capped cells over which the surface 1 is coextensive (which may be the complete honeycomb structure or a portion thereof); and that the apertures so pierced can be rapidly enlarged, as at 2', by the continued contact of the wax with the heated probes 2 during the piercing, so that the apertures are almost instantly made greater than the cross-dimensions of the probes. At the same time, the portions of the heat-radiating lower surface 1 between the probes 2 simultaneously heat all the wax capping surrounding the apertures 2' under the surface 1; and, as the surface 1 approaches closer to the capping 4', this softens and even causes combustion of such surrounding wax, rapidly uncovering the honey-filled cells 4. The surface 1 may also be brought momentarily into direct contact with what remains of the pierced, heated and at least partially combusted capping 4', such that when the apparatus 1-2 is removed, substantially all of the capping 4' will be found to be withdrawn. When so used, the length of the probes 2 is preferably somewhat less than that of the cells 4, so as to avoid damaging the bottom cover thereof. Whether brought into such contact, or held close to the capping 4' such that the heat becomes spread over the complete coextensive surface thereof, the cells are cleanly opened to permit ready and rapid extraction of the honey, and without damage to the cells or the frame, or the mixing of wax and honey, or the loss of honey—and all with very rapid speed.

A highly satisfactory hand-operated device of this character has been successfully employed with probes 2 of about half an inch in length, spaced 3/16 inch apart, and with about 400 watts of electrically generated heat over an area of about six square inches.

While the invention has been illustrated with a simple hand handle 7, clearly larger arrays and other handles or similarly functioning devices may also be employed; all such, together with further modifications that will readily occur to those skilled in this art, being considered to fall within the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. Apparatus for extracting honey from honeycombs containing honey in the cells thereof and covered by a substantially planar wax capping, having, in combination, a substantially planar heat-conducting and radiating surface of dimensions sufficient to be coextensive with at least a portion of the honeycomb capping, an array of heat-conducting probes in heat-transfer relation with said surface and transversely extending substantially

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normal to the plane thereof, the spacing between the probes corresponding substantially to the center-to-center spacing of the honeycombs cells, electrical means self-contained in said apparatus for applying heat to said surface and to said array of probes, and handle means by which said apparatus may be applied to the surface and array to the honeycomb capping with the plurality of probes substantially simultaneously mechanically and under heat piercing the corresponding portions of the capping covering the plurality of cells, first to provide apertures therein of dimensions greater than the cross-dimension of the probes as a result of the heating directly imparted by contact of the mechanically pierced wax with the heated probes, and then by the heat radiation from portions of said surface between probes softening and at least in part combusting the portions of the capping surrounding the apertures, thereby substantially to remove the capping as the said surface and probes are removed.

2. Apparatus as claimed in claim 1 and in which the applying means comprises insulating handle means for

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enabling application and removal of the said surface and array as a unit.

3. Apparatus as claimed in claim 1 and in which the said probes are provided with sharpened points and the length of the probes is somewhat less than the length of the honeycomb cells.

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