

F. WIELAND.
MANUFACTURE OF COMBS.
APPLICATION FILED NOV. 18, 1913.

1,092,884.

Patented Apr. 14, 1914
2 SHEETS-SHEET 1.

Fig. 1

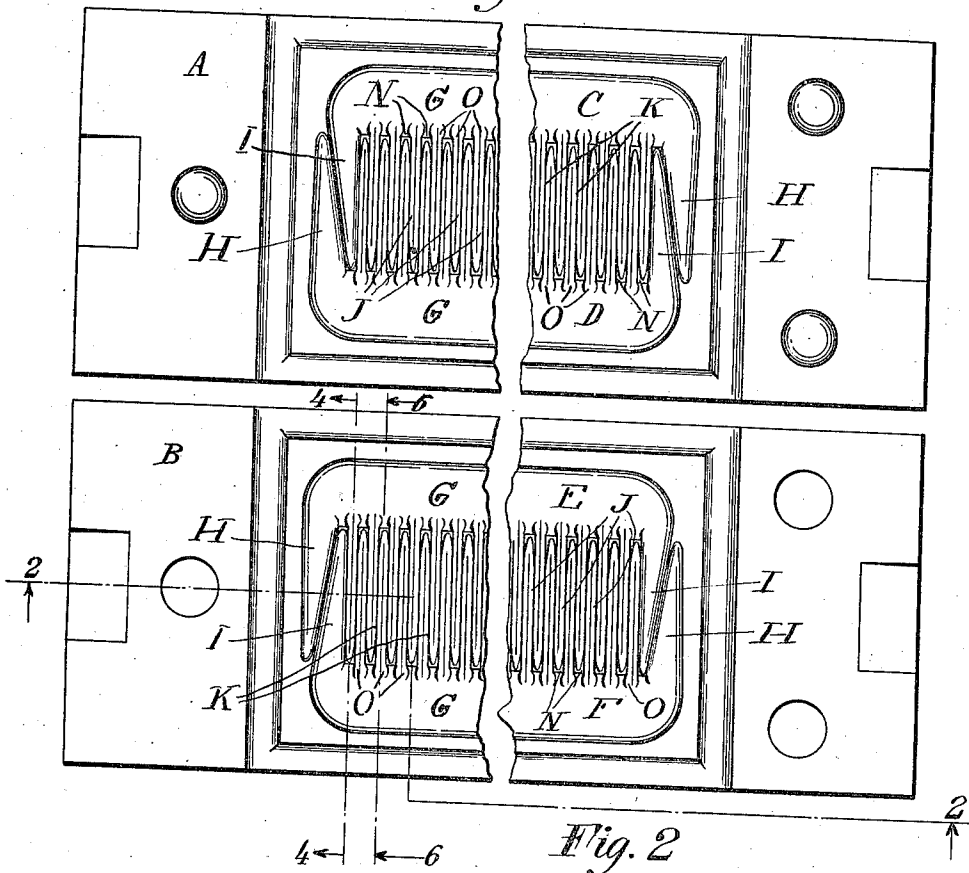


Fig. 2

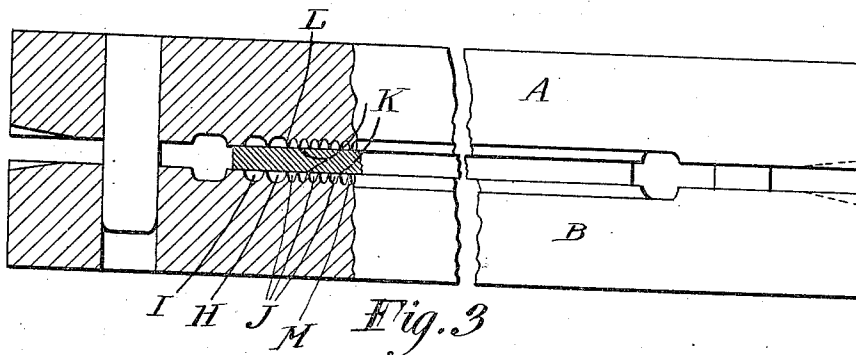


Fig. 3

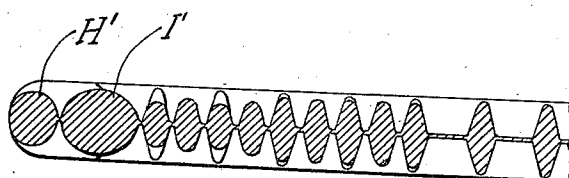
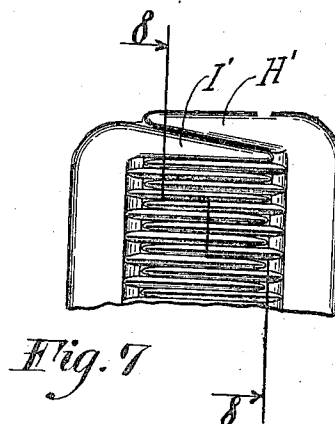
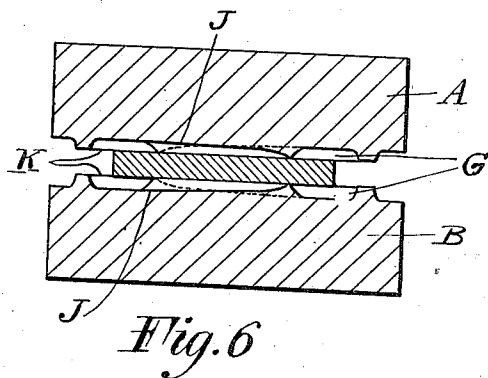
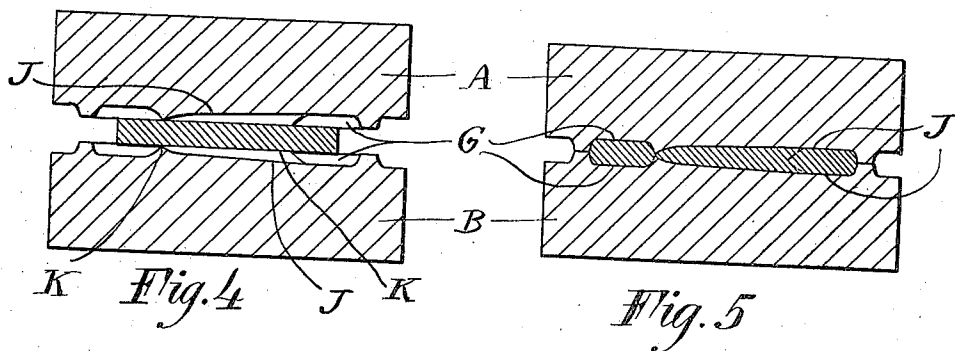
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UNITED STATES PATENT OFFICE.

FRIEDRICH WIELAND, OF POUGHKEEPSIE, NEW YORK, ASSIGNOR TO THE ARLINGTON COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

MANUFACTURE OF COMBS.

1,092,884.

Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed November 18, 1913. Serial No. 801,596.

To all whom it may concern:

Be it known that I, FRIEDRICH WIELAND, a citizen of the United States, and a resident of the city of Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in the Manufacture of Combs, of which the following is a specification.

The invention relates to the manufacture of combs and according to the present invention a strip of stock when in plastic condition is pressed between a pair of opposing dies which are so shaped that at the end of the pressing operation the resulting product is a comb blank having therein a pair of combs with intermeshing teeth that are connected by thin frangible webs. These connecting webs are easily ruptured whereby the combs in the blank can be readily separated and subsequently finished as by buffing off from each individual comb any small portions of the webs which may remain thereupon. Now it will be noted that one of the combs in the blank constitutes superfluous material in the blank as far as the second comb in the blank is concerned, that the teeth of the first mentioned comb constitute portions of substantial strength and thickness which are located in the internal spaces of said second comb, and that these portions or teeth of the first mentioned comb are connected to the teeth in the second comb merely by the thin frangible webs that are readily and easily broken.

In my copending application Serial No. 580,950 filed September 8th, 1910, for manufacturing combs and Serial No. 580,951 filed September 8th, 1910, for dies, I have shown and described a novel method of manufacturing combs, the dies employed in carrying out said method and also the blank resulting from the pressing of a piece of plastic stock between said dies. Both of said applications relate to the manufacture of combs by pressing the stock between dies which are so shaped that the material not required for a particular comb is connected when in the blank to said comb merely by thin easily frangible webs. In both of the said pending applications the superfluous material between the teeth of the comb is of substantial thickness whereby upon the application of pressure all of said superfluous material can be readily removed by

rupturing said easily frangible webs that connect said material to the comb teeth. In application Serial No. 580,950 the broad method of manufacturing combs in this manner and the resulting blank has been claimed as part of my invention while in application Serial No. 580,951 claims are included which are directed to the dies that are employed in the process described and claimed in application No. 580,950. In the application No. 580,951 there are shown two different forms of dies and one of these forms of dies (see Figure 5 of said application No. 580,951) is designed for the manufacture of a comb blank in which there are two combs having intermeshing teeth that are directly connected to each other merely by thin frangible webs. While the manufacture of combs by using said last mentioned form of dies is comprehended within certain broad claims which appear in both the application No. 580,950 and No. 580,951 still no claims which are limited specifically to the manufacture of combs by and in the form of dies shown in said Fig. 5 are included in said application No. 580,951 since it has been decided to present such specific claims in the present application.

Now when dies are employed that are of a proper shape to define a blank having combs with intermeshing teeth with thin connecting webs between them and a piece of rectangular stock is pressed between such dies some of the stock is forced first in opposite direction longitudinally of the stock by the cutting or scoring edges that define the teeth and thence transversely to the stock or longitudinally of the tooth forming grooves or depressions so that some part of the stock in each tooth forming depression will flow from the free end of the teeth toward and into the proper comb back forming depression in order to supply material to properly shape and fill the back of the comb. Applicant is the first to press a piece of stock between dies in such a manner that as the dies approach each other some of the material in the tooth forming depressions of the dies will flow toward and into the back forming portion of the die to supply sufficient material to insure a proper filling of the blank forming depressions during the pressing operation.

As showing a specific manner in which

the invention may be realized reference is made to the drawings forming a part of this specification and in which drawings:

Figs. 1 and 2 illustrate a pair of cooperating opposing dies employed for the manufacture of comb blanks having therein combs with intermeshing teeth which are connected; Fig. 1 being an inverted view of the under working surface of the upper die and Fig. 2 being a plan view of the lower or supporting die; Fig. 3 is a partial sectional elevation and a partial side view of the dies with a piece of stock between them in position to be operated upon; this figure illustrates a view of the assembled dies taken as on the broken line 2—2 of Fig. 2, looking in the direction of the arrows; Figs. 4 and 5 are cross-sectional views of the assembled dies taken as on the line 4—4 of Fig. 2; in Fig. 4 the dies are separated by the material or stock to be pressed while in Fig. 5 they are shown in the position which they occupy at the end of the pressing operation; Fig. 6 is a cross-sectional view of the assembled dies taken as on the line 6—6 of Fig. 2; in Fig. 6 the dies are shown separated by the piece of stock to be pressed; Fig. 7 is a plan view of the end portion of the blank as it appears at the end of the pressing operation; and Fig. 8 is an enlarged sectional view of the blank taken as on the broken line 7—7.

The upper die is designated by "A" and the lower die by "B". Each of these dies is provided with a plurality of comb forming matrices designated as "C" and "D" in the upper die and as "E" and "F" in the lower die. From an inspection of Figs. 1 and 2 it will be observed that each of these matrices comprises a longitudinally extending back forming depression "G", two transversely extending end teeth forming depressions such as "H" and "I" which lead to and communicate with the back forming depression and a series of transversely extending intermediate interdigitating tooth-forming depressions "J" which also lead to and communicate with the back forming depression "G". Each of the dies is also provided with a continuous sinuous cutting or scoring edge "K" which is common to both of said comb forming matrices in each of the dies. In other words this sinuous cutting or scoring edge is on the projecting portions "L" and "M" between the tooth forming depressions and on the projecting portions "N" between the closed portion of the tooth forming depressions and the back forming depressions.

The sinuous cutting edges on the opposing dies register with each other whereby as the two dies are pressed together the material which is in plastic condition will first be forced longitudinally of the dies and subsequently transversely of the dies or longitudinally of the tooth forming depressions to-

ward the comb back, of which it is to provide a part. The flow of some of the material in this manner is permitted because one end of each of the loops in the sinuous cutting edge is open on the side toward one of the back forming depressions while the other end is closed. The spaces at the open ends are indicated by "O" while the closed ends are defined by the projecting portions "N" previously referred to.

From an inspection of Figs. 4 and 6 it will be observed that the strip of stock prior to the pressing operation is of substantially the same thickness as the back of the comb in the resulting blank; that said stock prior to the pressing operation is much narrower than the resulting blank; that all the stock to provide the material for the back of the combs has been caused to move outwardly from the teeth toward the rear of the back forming depression and that some of the material which constitutes the back has been provided by the outward flow of material along the tooth forming depressions into the back forming depressions. A comb blank could however be made from a piece or strip of stock which is as wide as but thinner than the comb back in the resulting blank, (provided the stock is equal in volume to the volume of the desired resulting blank) by pressing such a strip of stock between the dies shown in Fig. 4. Such a piece of stock when pressed between said dies would have some of the material thereof forced longitudinally of the tooth forming depressions and toward and into the back forming depressions to provide sufficient material for the backs of the combs. It will also be observed that in the blank shown in Fig. 7, the end teeth "H" are displaced from their normal position relative to their intermediate teeth "J" to provide a receiving space for the end teeth "I" which are in their normal position relative to the intermediate teeth. The free or smaller ends of the teeth of the combs are also connected to the inner side of the comb backs while in the blank by similar thin web portions. At the end of the pressing operation these thin frangible webs are located between the cooperating continuous sinuous cutting edges previously described.

From an inspection of Fig. 5 taken in conjunction with Figs. 2 and 8 it will be noted that the teeth progressively increase in cross-sectional area in passing from the free or small ends thereof toward the back of the comb or what is the same thing that the cross-sectional area of the individual tooth forming depressions increases in cross-sectional area in passing from the closed portions "N" of the sinuous folds toward the open portions "O".

From an inspection of Figs. 4 to 8 inclusive, and also from what has preceded in the specification, it will be noted that the

resulting comb blank has interdigitating teeth connected by thin frangible webs and that this blank is formed from a strip of stock having a surplus of material at the 5 portions from which the comb teeth are formed and an insufficiency of material at the portions from which the comb backs are formed. It will also be noted that this insufficiency of material in the back forming 10 portion is supplemented by material which is caused to flow from the tooth forming portions into the back forming portions of the dies as they are pressed together.

After the combs have been separated the 15 end teeth "H", which are out of normal position, are bent as by the application of heat and pressure, to their normal position and the comb is ready for finishing as by buffing or polishing or otherwise.

20 The improvements herein set forth are not limited to the precise construction and arrangement of parts shown and described, as they may be embodied in various forms and modifications without departing from the spirit and scope of the invention. 25

What I claim is:

1. The process of forming a comb from a strip of stock that presents a surplus of material at the portion from which the teeth 30 are formed and an insufficiency of material

at the portion where the back is formed, said process consisting in placing said strip of material between a pair of opposed dies and pressing said dies toward each other to cause the surplus material at the tooth 35 forming portions to flow toward and into the back forming portions to enlarge and supply material for the latter.

2. The process of forming a comb blank having interdigitating teeth connected by 40 thin frangible webs, from a strip of stock having a surplus of material at the portion from which the comb teeth are formed, and an insufficiency of material at the portions 45 from which the comb backs are formed, said process consisting in placing said strip of material between opposed dies having interdigitating tooth forming depressions and pressing said dies toward each other to cause the surplus material at the tooth form- 50 ing portions of the blank to flow toward and into the back forming portions to enlarge and supply material for the latter.

This specification signed and witnessed this 10th day of November, A. D. 1913.

FRIEDRICH WIELAND.

Signed in the presence of—

G. McGRANN,

D. HAROLD BUSH.