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CORK PRODUCT AND THE MANUFACTURE THEREOF.

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This invention relates to improvements in cork products and the art of manufacturing said products; the object of the invention being to produce a superior product in a simple and effective manner.

Cork possesses certain physical characteristics which make it highly desirable for a wide variety of uses but the actual uses to which it is put are more or less restricted by certain physical limitations of the natural product such for example as the shape and size of the pieces of cork bark as they come from the trees, the wide range in quality of the bark and frequency with which pores or open cells occur therein. Moreover, in the manufacture of various articles from cork in its natural state there is bound to be a great deal of waste material.

The present invention contemplates the production of a superior cork product which will possess many of the desirable characteristics of cork in its natural state and which will be free from certain of the limitations inherent therein so that the manufactured product will thereby be rendered available for a great many uses to which cork in its natural state and many of the present forms of composition cork cannot be put. Furthermore, the cork product of the present invention will possess desirable characteristics not found in natural cork or in any of the presently known forms of manufactured or composition cork.

The invention, in so far as it relates to the product, will be described in connection with a preferred and illustrative embodiment thereof which, when completed, takes the form of a web or sheet of any desired thickness but preferably quite thin, and the preferred method of producing said web or sheet will be described to illustrate so much of the invention as relates to the art of manufacture.

A web or sheet embodying the present invention may comprise a number of cork particles preferably so arranged that they present plane surfaces of substantial area in contact with one another and preferably in planes substantially parallel with the plane of the web or sheet. These cork particles may be of various shapes and sizes each preferably possessing two substantially plane and nearly parallel surfaces of appreciably greater area than the area of the exposed edges. The preferred form of cork particle used is very thin and is preferably broken up into scales or flakes somewhat resembling paper confetti.

Cork bark as it comes form the tree and after removing only the hard outer bark may be advantageously and economically used in its entirety in the production of the cork particles referred to, or suitable forms of cork waste may be utilized. Assuming that the cork bark as it comes from the trees is to be used, I will describe a course of procedure or sequence of operations which may be followed in carrying out the present invention.

As above stated, the hard outer bark is preferably removed in some suitable manner and then the remaining cork is cut by suitable knives into thin sheets approximating the thickness of ordinary paper. This operation may be carried out without any appreciable waste. If the resulting sheets or shavings are of considerable size, they are preferably cut or broken up into what may be termed flakes or scales of a more or less uniform size for convenience in subsequent manipulation and for the purpose of giving added uniformity of texture and quality to the finished product.

In order that the finished product may have those desirable characteristics of natural cork which are found in sheets cut along lines substantially parallel to the layers of yearly growth, the paper thin sheets or shavings above mentioned are preferably, although not essentially, formed by cutting or shaving the cork along such lines. This method of cutting produces thin sheets or shaving of maximum flexibility and when the sheets or flakes are assembled in the finished product, as hereinafter explained, such relation adds materially to the flexibility of the finished product.

Having obtained or produced suitable cork particles preferably in the manner described, they are brought together in a layer many times the thickness of the finished product. As the particles are brought together they naturally tend to assume a more or less overlapping face-to-face relationship which is augmented by the subsequently applied pressure. If, however, this tendency is not sufficient it may be increased as by vibrating the support upon which the layer of particles rests. This applies whether a continuous web or single sheet is being formed as will be apparent. If desired, a suitable cementitious

material such, for example, as glue, gelatine, rubber, resin and other gums, linseed and other oils, and the like, may be mixed with the cork particles but it is preferred to omit any foreign cementitious material and rely upon the resinous matter contained in the cork to bind the particles together.

The cork particles so assembled are now subjected to such suitable heat and pressure as will partially volatilize and otherwise liberate the resinous matter contained in the cork and cause the cork particles to adhere to each other, at the same time compressing the cork from its natural state to an extent varying from one-sixth to one-twentieth of its original volume depending upon the product desired. For some purposes I find that a low compression as from six to one is quite satisfactory, as it produces a comparatively springy sheet, whereas where the requirements are for a dense, hard and impervious sheet, I find it desirable to compress up to twenty to one. This operation may be carried out intermittently in the manufacture of sheets or continuously if a continuous web of material is to be formed. In either event the cork is preferably heated to a temperature of approximately 575° F. for a period of time depending upon the thickness of the sheet or web being formed. The absolute pressure to which the cork is subjected will vary within wide limits and will depend upon the kind and quality of the cork, the condition of the cork as to form, moisture content and the like, and the product desired. In the case of a relatively thin web or sheet certain of the volatile gases formed as a result of the application of heat are permitted to escape in whole or in part, directly from the surface of the web or sheet as by interposing a fine mesh wire cloth between the cork and the face of one or both cooperating plates. This provision for the escape of volatile gases is highly desirable, if not essential, in the production of a thin web or sheet of homogeneous composition throughout.

Preferably the assembled heated and compressed cork particles are cooled without removing the pressure therefrom in order that the resinous matter may be more quickly condensed or solidified to firmly cement the cork particles together while they are still held in intimate contact one with another.

The superior quality of composition cork manufactured in accordance with the present invention is readily observable. The overlapping face-to-face relationship of the individual particles not only permits of an exceedingly strong union between adjacent particles but materially increases the flexibility of the finished product particularly when the product is made in the preferred form above described from the paper thin flakes or scales. Moreover, the finished product is impermeable to a degree not found in natural cork or in any of the presently known forms of composition cork. Due to the fact that binders or other foreign material are preferably omitted, the finished product will not shrink or warp to any appreciable extent and will be substantially non-absorptive. Furthermore, the natural resins contained in the cork which are partially liberated by the applied heat will be so disposed in the relation of the surfaces of the finish product as to render the finished sheet more nearly impermeable than natural cork or any of the presently known forms of composition cork and the natural pores will be closed and effectively sealed.

These and other qualities of the finished product render it available for uses in which sheets of cork of large superficial area are desired, such as floor and wall coverings, linoleum, heat and sound insulation and the like. When made in relatively thin sheets the material is admirably adapted for use as gaskets and other packings and also as the sealing disk in closures for bottles or other containers.

It is to be understood that the invention is not limited to the precise structure or method of manufacture herein described for purposes of illustration, but on the contrary may be variously modified and embodied within the scope of the subjoined claims.

I claim as my invention:

1. As an article of manufacture, a composition cork product comprising a multiplicity of initially undistorted cork particles each having surfaces of substantial area disposed in substantially parallel planes throughout the mass and adhering one to another.

2. As an article of manufacture, a composition cork product comprising a multiplicity of initially undistorted substantially flat cork particles adhering to one another in substantially overlapping face-to-face relationship.

3. As an article of manufacture, a composition cork product comprising a multiplicity of flake-like cork particles cut to shape and adhering to one another in substantially overlapping face-to-face relationship.

4. As an article of manufacture, a sheeted composition cork comprising a multiplicity of initially undistorted cork particles each having cut surfaces of substantial area disposed substantially parallel to the plane of the sheet and overlying and adhering one to another.

5. As an article of manufacture, a sheeted composition cork comprising a multiplicity of flake-like particles of cork cut to shape and disposed substantially parallel to the plane of the sheet and overlying and adhering one to another.

6. As an article of manufacture, a sheet of composition cork moulded and compressed to

usable thickness and comprising a multiplicity of initially undistorted substantially flat cork particles of uniform density adhering to one another in substantially overlapping face-to-face relationship.

7. A cork product comprising a multiplicity of substantially flat initially undistorted adhering pieces of cork of uniform density of greater diameter than thickness arranged substantially in overlapping face-to-face relationship.

8. A cork product comprising a multiplicity of adhering cork flakes cut to shape and arranged substantially in overlapping face-to-face relationship.

9. A composition cork product comprising a multiplicity of cork flakes cut to shape and bound to each other by their inherent cementitious matter.

10. A composition cork product comprising a multiplicity of substantially flat cork particles cut to shape and arranged in overlapping relationship and bound together by their inherent cementitious matter.

11. A composition cork product comprising a multiplicity of paper-thin flakes of natural density bound together by their inherent resinous matter.

12. A sheeted composition cork product, comprising a multiplicity of cork flakes cut on planes substantially parallel with the lines of yearly growth, arranged and adhering to one another in substantially overlapping face-to-face relationship.

13. A composition cork product comprising a multiplicity of cork flakes cut on planes substantially parallel to the lines of yearly growth, arranged in substantially overlapping face-to-face relationship and adhering to each other by their inherent resinous matter.

14. The improvement in the art of manufacturing composition cork, which consists in shaving the cork bark to form paper-thin particles, assembling said particles and subjecting the same to heat and pressure thereby to cause said particles to adhere one to another in overlapping substantially face-to-face relationship.

15. The improvement in the art of manufacturing composition cork, which consists in shaving the cork bark along planes substantially parallel to the layers of yearly growth to form paper-thin particles, assembling said particles and subjecting the same to heat and pressure thereby to cause said particles to adhere in overlapping substantially face-to-face relationship.

16. The improvement in the art of manufacturing composition cork, which consists in shaving the cork bark to form paper-thin shavings, breaking up said shavings into flakes, assembling said flakes in a layer of substantial thickness and subjecting the same to heat and pressure thereby to cause said flakes to adhere in overlapping substantially face-to-face relationship.

17. The improvement in the art of manufacturing sheeted cork composition, which consists in shaving the cork bark in planes substantially parallel to the layers of yearly growth to form paper-thin shavings, breaking up said shavings into flakes, assembling said flakes in a layer of substantial thickness and subjecting the same to heat and pressure thereby to position said flakes in planes parallel with the surface of the sheet and to cause said flakes to adhere in overlapping substantially face-to-face relationship.

In testimony whereof, I have signed my name to this specification this 21st day of November, 1923.

ENRIQUE VINCKE.