MICROPOROUS HOLLOW FIBER WEBS AND METHODS OF MAKING SAME

BACKGROUND

Webs of connected hollow strands have been formed, such by using extrusion methods. Such webs lack porosity, however.

SUMMARY

A microporous hollow fiber web is provided. The microporous hollow fiber web comprises a plurality of connected hollow fibers. At least some of the hollow fibers comprise an open celled porous structure comprising microfibrils that connect lamellae microstructures.

In an aspect, there is provided a microporous hollow fiber web comprising a plurality of connected hollow fibers, wherein at least some of the hollow fibers comprise an open celled porous structure comprising microfibrils that connect lamellae microstructures.

A method of making a microporous hollow fiber web is also provided. The method comprises obtaining a hollow fiber web comprising a plurality of connected hollow fibers; and stretching the hollow fiber web in a machine direction to fracture at least a portion of the hollow fibers to generate an open celled porous structure comprising microfibrils that connect lamellae microstructures in the fractured hollow fibers.

In another aspect, there is provided a method of making a microporous hollow fiber web, the method comprising: obtaining a hollow fiber web comprising a plurality of connected hollow fibers; and stretching the hollow fiber web in a machine direction to fracture at least a portion of the hollow fibers to generate an open celled porous structure comprising microfibrils that connect lamellae microstructures in the fractured hollow fibers.

At least certain examples of the present disclosure provide a simplified process to prepare a microporous hollow fiber web by stretching a hollow fiber web to form an open celled porous structure including microfibrils that connect lamellae microstructures. Hollow fiber webs may be produced by extrusion processes such as those described in PCT Publication Nos. WO 2020/170115, WO 2021/028798, and WO 2021/250478 (each to Ausen et al.). Stretching is then applied to the hollow fiber web. Unexpectedly, good fiber porosity has been achieved by such a process, which has the potential to significantly reduce costs of manufacturing microporous hollow fiber webs. For instance, in an alternative method of forming a microporous hollow fiber web, a typical air-laid process would require several more total steps: extruding hollow fibers, stretching the hollow fibers to form pores, and knitting individual porous hollow

fibers together to form a web. Porous hollow fiber webs may be useful in filtration or other separation applications, for example.

The above summary of the present disclosure is not intended to describe each disclosed example or every implementation of the present disclosure. The description that follows more particularly exemplifies illustrative examples. In several places throughout the application, guidance is provided through lists of examples, which examples can be used in various combinations. In each instance, the recited list serves only as a representative group and should not be interpreted as an exclusive list.