Sept. 6, 1960 J. SKUBIC 2,951,472

INTERNAL COMBUSTION ENGINE REPLACEABLE CYLINDER SLEEVE

Filed July 18, 1958

FIG. 1

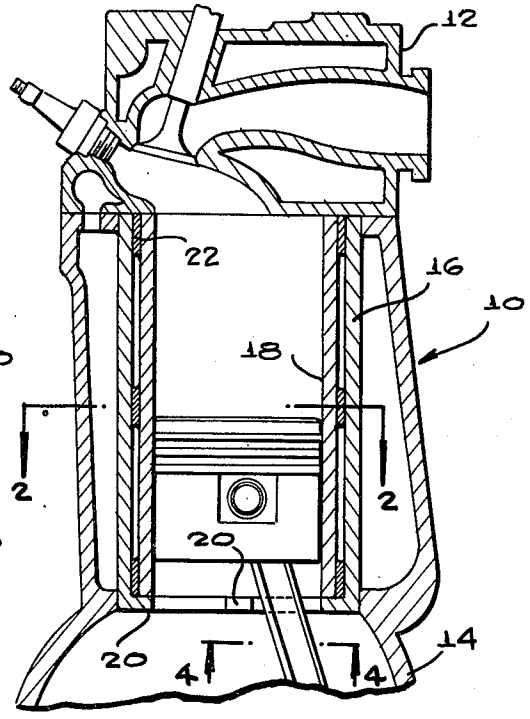


FIG. 4

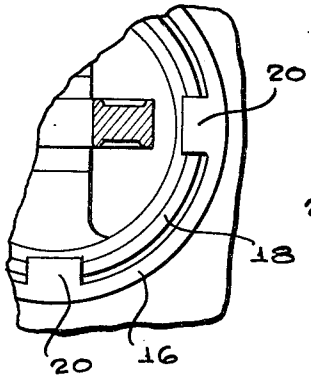


FIG. 2

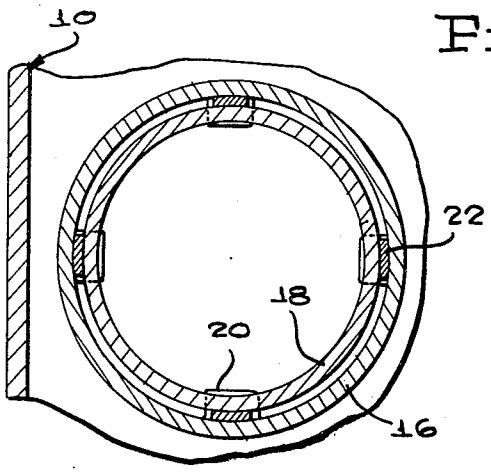
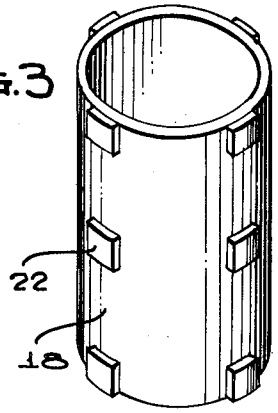


FIG. 3



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INTERNAL COMBUSTION ENGINE REPLACEABLE CYLINDER SLEEVE

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2 Claims. (Cl. 123—41.72)

The present invention relates to internal combustion engines generally and specifically to a replaceable cylinder sleeve for insertion into and withdrawal from the internal combustion engine.

An object of the present invention is to provide a cylinder sleeve which lends itself to interchangeability between various internal combustion engines, one which is readily inserted into and withdrawn from such an engine, and one which lends itself to the saving of time and labor in the installation of interchangeable sleeves in internal combustion engines.

Another object of the present invention is to provide an interchangeable replaceable sleeve for an internal combustion engine cylinder which is sturdy in construction, one simple in structure, and one economical to manufacture and assemble.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in conjunction with the annexed drawing, in which:

Figure 1 is a sectional view through the engine block of an internal combustion engine showing the replaceable cylinder sleeve of the present invention installed therein;

Figure 2 is a view taken on the line 2—2 of Figure 1;

Figure 3 is an isometric view of the replaceable cylinder sleeve according to the present invention;

Figure 4 is a fragmentary view taken on the line 4—4 of Figure 1.

Referring to the drawing in which like numerals indicate like parts throughout the several views, the reference numeral **10** in Fig. 1 designates an internal combustion engine cylinder block having a cylinder head **12** mounted upon one end and a crankcase **14** open at the top connected in communication with the lower end of the cylinder block **10**. The block **10** is provided with an upstanding open-ended cylinder **16** extending from the cylinder head **12** to the crankcase **14**. Means is carried on the lower open end of the cylinder **16** for supporting within the cylinder **16** a sleeve **18** having one end contiguous to the cylinder head **12** and the other end resting upon the means. Such means comprises a plurality of spaced ledges **20** extending about the inner wall of the cylinder **16** and projecting inwardly from the inner wall of the cylinder **16**.

A sleeve **18** is positioned concentrically with respect to and spaced from the inner wall of the cylinder **16** and a plurality of centering blocks **22** are arranged in spaced relation about the exterior surface of the sleeve **18** and are slidably engageable with the inner surface of the cylinder **16** when the sleeve **18** is moved into its position within the cylinder **16** or withdrawn from its position within the cylinder **16**.

In use, the replaceable cylinder sleeve **18** may be inserted into the cylinder **16** after the cylinder head **12** has been removed from its attachment to the engine block **10**. The lower end of the sleeve **18** may be caused to rest upon the ledges **20** and upon replacement of the cylinder head **12** on the block **10**, the sleeve **18** will be held against longitudinal movement within the cylinder **16**. The centering blocks **22** will maintain the sleeve concentrically within and spaced from the cylinder **16**. When it is desired to replace the sleeves in an engine equipped with the replaceable sleeves of the present invention, it is only necessary to remove the cylinder head from the cylinder block, remove the sleeves and replace the sleeves with new or repaired ones as desired.

While the replaceable cylinder sleeve **18** is here shown and described as installed in an internal combustion engine, it also may be employed in steam engines, fluid pumps, and in any machine or apparatus having cylinders.

What is claimed:

1. In an internal combustion engine, an upstanding open-ended cylinder, a sleeve positioned concentrically within and spaced from said cylinder, means embodying a plurality of spaced ledges extending about and projecting inwardly from the inner wall of said cylinder and supporting the lower open end of said sleeve for retaining the sleeve within said cylinder, and means interposed in the space between said sleeve and cylinder for holding said sleeve in spaced relation with respect to said cylinder.

2. In an internal combustion engine, an upstanding open-ended cylinder, a sleeve positioned concentrically within and spaced from said cylinder, means embodying a plurality of spaced ledges extending about and projecting inwardly from the inner wall of said cylinder and supporting the lower open end of said sleeve for retaining the sleeve within said cylinder, and a plurality of centering blocks arranged in spaced relation about the exterior surface of said sleeve and slidably engaging the inner surface of said cylinder.

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