Aug. 21, 1962 D. C. SEAMANS ETAL 3,050,286

PULLEY BLOCK

Filed Sept. 18, 1957 2 Sheets-Sheet 1

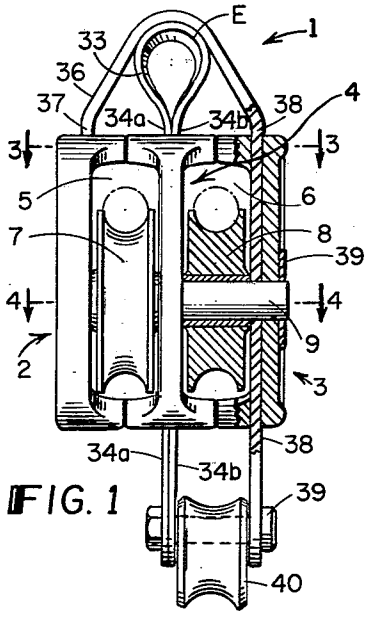


FIG. 1

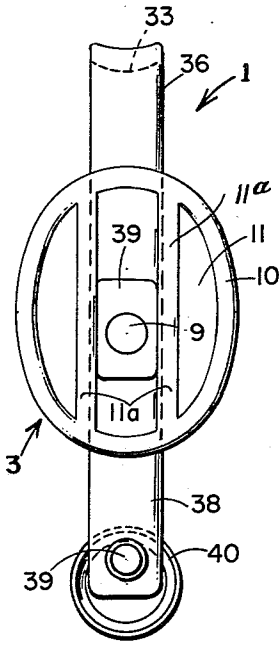


FIG. 2

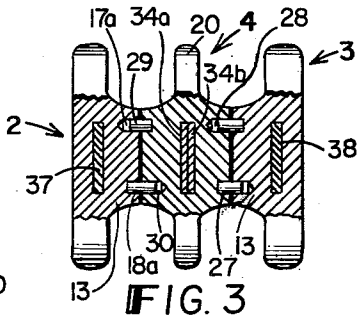


FIG. 3

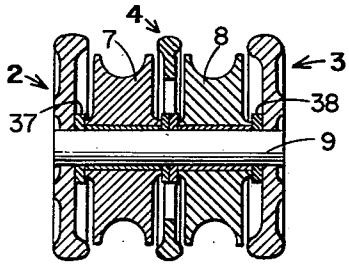


FIG. 4

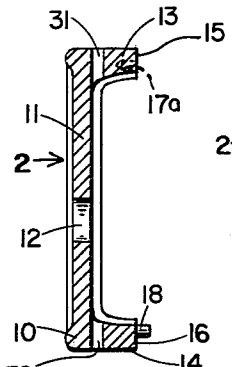


FIG. 6

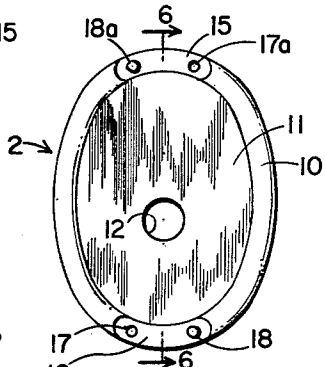


FIG. 5

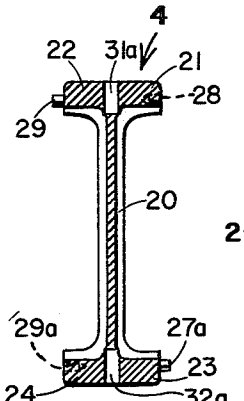


FIG. 9

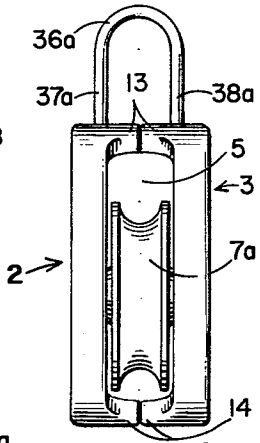


FIG. 10

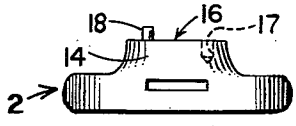


FIG. 7

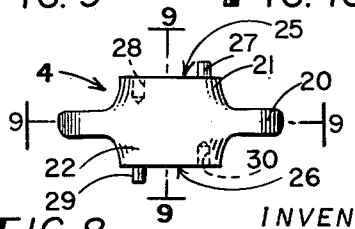


FIG. 8

INVENTORS
Donald C. Seamans
Wyatt A Ingalls
BY
ATTORNEY.

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PULLEY BLOCK

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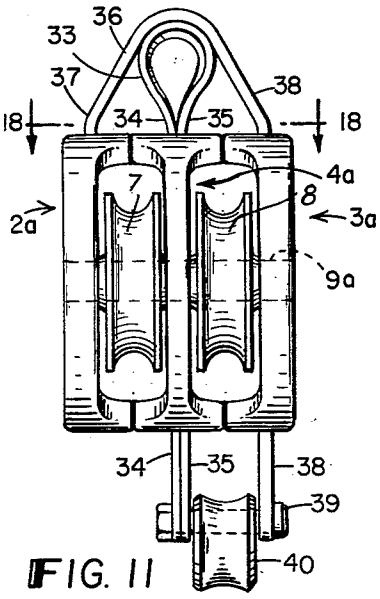


FIG. 11

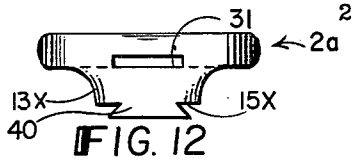


FIG. 12

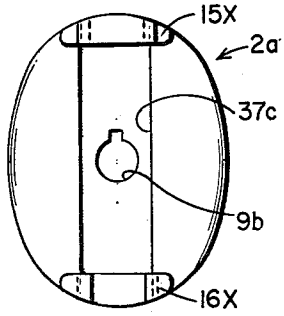


FIG. 13

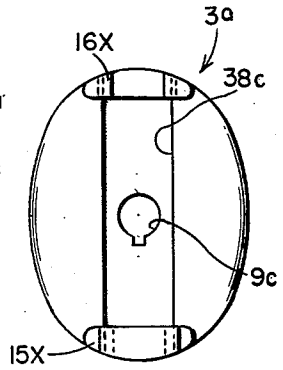


FIG. 16

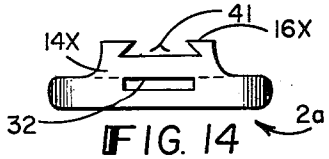


FIG. 14

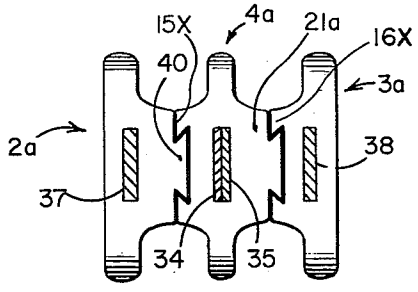


FIG. 18

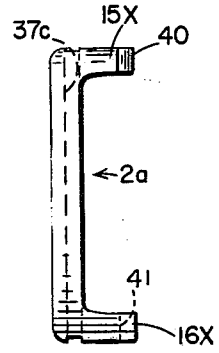


FIG. 15

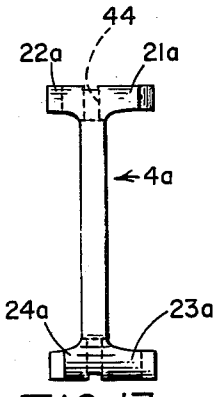


FIG. 17

INVENTORS
Donald C. Seamans
BY Wyatt O. Ingalls
Robert Cushman, Grover
ATTORNEY.

United States Patent Office 3,050,286 Patented Aug. 21, 1962

3,050,286

PULLEY BLOCK

Donald C. Seamans, Marblehead, and Wyatt O. Ingalls, North Reading, Mass., assignors to Boston & Lockport Block Co., Boston, Mass., a corporation of Massachusetts

Filed Sept. 18, 1957, Ser. No. 684,687
3 Claims. (Cl. 254—192)

This invention pertains to pulley blocks and, more especially, to the shell, frame or body of such a block and to a method of making such shell.

Pulley blocks are employed in hoisting tackle and in other situations where it is desired to use a pulley or pulleys for transmitting force and/or increasing power. The block usually comprises a shell, frame or body having therein one or more mortises or chambers, each housing a corresponding pulley. Thus, the block may be designed to house a single pulley or it may house a plurality of pulleys, for instance as many as four, usually coaxial and turning on the same pintle pin which is fixed to the shell of the block.

In earlier times, the shell or body of the block was made of wood and, even at present, many blocks, of the larger size, in particular, are of wood, although metal blocks are now largely employed. The shell of the block comprises outer walls or cheeks with spacers at top and bottom and, if the shell is to house more than one pulley, then an intermediate wall or septum is interposed between adjacent pulleys so as properly to confine each run of rope to its intended pulley and also to provide intermediate support for the pintle pin. In order to hold the several constituent parts of the shell in assembled relation, a wooden block usually comprises a strap or cringle which seats in a groove in the outer faces of the cheeks and which forms a band, tightly embracing the shell, additional means such as bolts, rivets and so forth also being commonly employed in uniting the parts. Since the parts which form the shell or frame are irregular in shape, much skilled labor is involved in making such parts from wood and assembling them; likewise, if the shell be of metal, the operations involved in correctly shaping and finishing the shell are difficult and expensive so that whether of wood or of metal, the making of such blocks, according to customary prior procedures, has been time consuming and is unduly costly at present day rates for skilled labor.

The present invention has for an object the providing of a novel pulley block, whether a single or multiple block, which can be made with a minimum amount of hand labor and much more rapidly and at very less cost than blocks made by customary methods.

A further object is to provide a block which may be made of an appropriate moldable material but by the employment of but a single mold, if the block is to be a single pulley block; or, by the use of but two different molds, if the block is to be a multiple pulley block. A further object is to provide a pulley block comprising outside members or cheeks which are identical in shape and size and which may be assembled to form a single pulley shell, or which may be assembled, with one or more identical interior wall members, to form a multiple pulley shell. A further object is to provide a block, whether single or multiple, wherein the constituent parts of the shell, although initially separate, are integrally bonded together so that the shell requires no fastener elements (other than the pintle pin) for holding the parts in permanent assembly. A further object is to provide a pulley block whose constituent parts are of a synthetic plastic, for instance nylon, which has the requisite strength and durability, and which may be made at a

cost substantially lower than that involved in the manufacture of pulley blocks by customary methods.

Other and further objects and advantages of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings wherein:

FIG. 1 is a front elevation, partly in vertical section, illustrating the present invention as embodied in a double pulley block;

FIG. 2 is a side elevation of the device shown in FIG. 1;

FIG. 3 is a horizontal section, substantially on the line 3—3 of FIG. 1;

FIG. 4 is a horizontal section on the line 4—4 of FIG. 1;

FIG. 5 is an inside view of one of the outer walls or cheeks of the block shown in FIG. 1 before its assembly with other parts;

FIG. 6 is a section substantially on the line 6—6 of FIG. 5;

FIG. 7 is a bottom plan view of the part shown in FIG. 5;

FIG. 8 is a plan view of the intermediate wall or septum, forming an element of the block of FIG. 1, before its assembly with other parts;

FIG. 9 is a section on the line 9—9 of FIG. 8;

FIG. 10 is a view similar to FIG. 1, but showing a single pulley block;

FIG. 11 is a view similar to FIG. 1, but showing a pulley block in which the outer walls or cheeks and the intermediate wall or septum are initially shaped somewhat differently from those shown in the preceding figures;

FIG. 12 is a plan view illustrating the shape of the upper portion of one of the outer walls or cheek members of the block of FIG. 11;

FIG. 13 is an inside view of the left-hand cheek member;

FIG. 14 is a bottom plan view showing the lower part of the cheek member of FIG. 13;

FIG. 15 is an edge elevation of one of the cheek members employed in the block of FIG. 11;

FIG. 16 is a view similar to FIG. 13, but showing the right-hand cheek member;

FIG. 17 is an edge elevation of the intermediate or septum member shown in FIG. 11; and,

FIG. 18 is a section substantially on the line 18—18 of FIG. 11.

It is contemplated that the block herein disclosed will comprise cheek members of a moldable material and, if an intermediate member or septum is used, that this latter will also be of a moldable material. While it is considered as with the purview of the invention to use a metal as such moldable material, the material at present preferred for the purpose is one of the synthetic resins which is capable of being molded and which, after molding, is hard and shape-retaining and not subject to deterioration by exposure to air, moisture or salt water. One such material which has been found highly desirable for the purpose is nylon, although it is to be understood that the invention, in its broader aspects, at least, is not limited to the employment of this particular material. As already pointed out, one of the principal objects of the invention is to provide a pulley block which can be made very cheaply but which still possesses the characteristics desirable in such a device.

Referring to the drawings, the numeral 1 designates a double pulley block embodying the present invention as illustrative of the construction of a multiple pulley block, it being understood that by the use of parts similar to those shown in FIG. 1, blocks having a larger number of pulleys may be made.

This block 1 comprises the outer walls or cheeks 2 and 3 and the intermediate wall or septum 4 which by their assembly define the chambers or mortises 5 and 6 within which the pulleys 7 and 8 are located. In accordance with the present invention, the cheek members 2 and 3 are of identical contour and dimensions so that they may both be molded by the use of the same mold. The septum member 4 is of a shape different from that of the cheek members and thus requires a second mold, but if the block be one which comprises more than two pulleys, each additional septum will be like the first, so that regardless of the number of pulleys, not more than two molds are required to form the necessary parts of the shell.

Each of the cheek members, for example the cheek member 2, is a unitary mass of the selected material and of an external contour such as generally indicated in FIG. 2, although this contour may be varied without departing from the spirit of the invention. The cheek member has a smoothly finished rim portion 10 which borders a thinner panel portion 11, here shown as having the stiffening ribs 11^a. In the panel portion 11, there is provided, at the desired location, an opening 12 for the reception of the end of the pintle pin 9 on which the pulleys are mounted. The rim 10 is thickened at the upper and lower portions of the cheek member to form spacer elements 13 and 14 (FIG. 6) having the flat inner faces 15 and 16, respectively, these faces being spaced from the plane of the rim proper a distance equaling one-half the desired transverse width of the pulley-receiving chamber 5 or 6.

Preferably, the spacer 14 is provided with a projecting positioning element 18, for example a pin, and a socket 17, of a shape such as to receive such a pin, the pin and socket being spaced apart transversely. The other spacer element 13 of the cheek member has a similar positioning pin 18^a and socket 17^a, it being noted by inspection of FIG. 5, that the pin of one spacer member is vertically below the socket of the other spacer member.

If the pulley block is to house more than one pulley, then an intermediate member or septum 4 for each additional pulley is required. Such a septum is shown in detail in FIGS. 8 and 9. This intermediate member comprises the rim 20 but is without any panel (such as the panel 11 of the cheek member) so that the space within the rim is open and unobstructed. The rim 20 is thickened at its upper and lower portions (FIG. 9) providing the oppositely directed spacer members 21 and 22 at its upper portion, and the oppositely directed spacer members 23 and 24 at its lower portion. The outer face 25 (FIG. 8) of the upper spacer element 21, for example, has a projecting positioning pin 27 and a corresponding socket 28; while, the opposite upper spacer member 22 has the outer face 26 provided with the projecting positioning pin 29 and corresponding socket 30. The lower spacer members 23 and 24 are similarly provided (FIG. 9) with positioning pins 27^a and 29^a and sockets (not shown) corresponding thereto. The positioning pins may, if desired, be metal parts molded into the cheek pieces and septum, or preferably they may be integral portions of the material forming the cheek pieces and septum.

In preparing a double pulley block like that of FIG. 1, one of the cheek pieces is first assembled with the intermediate member so that, for example, the pin 29 of the intermediate member enters a socket 17^a of the cheek piece, while the pin 18^a of the cheek piece enters the socket 30 of the intermediate member, the corresponding arrangement of the positioning pins and sockets occurring at the lower portions of the cheek member and intermediate member. The other cheek member is now assembled with the intermediate member so that their pins and sockets engage. The accurate assembly of the several parts in registering relation is thus assured. Before the flat faces of the spacer members are actually brought into contact, these faces are caused to become adhesive, either by the application of a solvent or plasticizer for the material forming the cheek pieces and intermediate member, or by the use of some adhesive substance which is compatible with the material forming the cheek pieces and intermediate member. The assembly is now subjected to pressure and/or heat, if necessary, whereby the assembled cheek pieces and intermediate member are bonded together, preferably by what amounts to an integral union so that they become, in fact, a unitary mass of material needing no other means for connecting them, although the pintle pin, when in place, does provide added assurance against possible separation of the parts.

As illustrated, the cheek pieces are provided with slots 31 and 32 in the spacer elements 13 and 14, and the spacer elements of intermediate member 4 are also provided with slots 31^a and 32^a. A hanger 33 is provided, as shown in FIGS. 1 and 2, this hanger comprising a length of metal strapping doubled to form the open eye E and the parallel legs 34^a and 34^b. This hanger is so arranged that these legs extend down through the slots 31^a and 32^a of the intermediate member 4. A second hanger member 36, likewise made of metal strapping (which may, if desired, be somewhat thicker than that used in making the hanger 33) is so shaped as to provide a bight which overhangs and embraces the hanger 33, this secondary hanger having the parallel legs 37 and 38 which extends down through the slots 31 and 32 of the respective cheek pieces. The legs of both of these hanger members are provided with openings for the passage of the pintle pin 9. After the cheek pieces and intermediate member have been assembled and united to form a unitary shell, as above described, the legs of the hangers are inserted in the slots, the pulleys 7 and 8 are placed in the chambers 5 and 6, respectively, and the pintle pin is passed through the openings in the cheek pieces and in the hanger legs and through the central openings of the pulleys. The pintle pin may be retained in position in any desired way, for example by cotter pins; but, as here shown, is prevented from moving endwise relatively to the pulley block by spring nuts or clips 39 of a conventional type.

As illustrated in FIG. 1, the pulley block is provided with an attachment for the dead end of the rope or cable, by extending the legs 34^a and 34^b of the hanger 33 and the leg 38 of the hanger 36 downwardly below the shell to provide a support for a bolt or pintle 39 on which a clevis 40 is mounted. However, it should be understood that if such dead end attachment is not desired, the legs 34^a, 34^b and 38 may be terminated at the lower surface of the block.

In FIG. 10, a single pulley block is illustrated in which the cheeks 2 and 3 are directly united without an interposed septum so as to provide the single chamber 5 in which the pulley 7^a is housed. The cheek pieces 2 and 3 of FIG. 10 are alike and may be exactly like the cheek pieces 2 and 3 above described. In this instance, a single hanger 36^a is provided and its legs 37^a and 38^a extend down through the slots of the cheek pieces and have aligned openings for the passage of the pintle on which the pulley 7^a is mounted.

In FIGS. 11 to 18, a slightly modified construction is shown. The block shown in FIG. 11 is a double block similar to that of FIG. 1 and only differs from the latter in the initial shape of the spacer members and positioning elements of the cheeks and septum. Thus, each of the cheek pieces 2^a and 3^a (which are identical in construction) has an integral spacer member 13^x and 14^x, at its upper and lower portion respectively. In this instance, the upper spacer member 13^x (FIG. 12) has the inner flat surface 15^x, and from this flat surface projects a dovetail-shaped positioner element 40. The lower spacer member 14^x has the flat inner surface 16^x and is provided with the dovetail slot or socket 41 (FIG. 14) of such dimensions as to receive a dovetail positioner element like the part 40. The intermediate member 4^a is provided with spacer members 21^a, 22^a and 23^a, 24^a projecting in opposite directions from its upper and lower parts, the

two spacer members 21a and 22a at the upper part of the member 4a being provided with a dovetail projection and with a dovetail slot, respectively, like those above described, and the spacer members 23a and 24a at the lower end of the member 4a being provided likewise with dovetail projection and dovetail slot, but with the projection of an upper member directly above a slot in the corresponding lower member.

In assembling the parts, the upper dovetail slot at one side of the member 4a is assembled with the corresponding cheek pieces so that the upper projection 40 of the latter enters the slot while, at the same time, the lower dovetail projection, at the same side of the member 4a, enters the slot at the lower part of the member 2a. In a similar way, the upper dovetail projection of the intermediate member is caused to engage the slot in the upper spacer of the cheek piece 3a while the projection at the lower part of the cheek piece 3a enters the slot at the lower part of the member 4a. This mode of uniting the parts may make it unnecessary to employ other means for joining them and provides a very accurate means of placing the parts in properly assembled relation. However, it is preferred to submit the parts, after assembly or in preparation for assembly, to a suitable treatment whereby when once assembled, they become integrally and permanently joined together.

Having assembled the parts of the shell as above described, the other parts which go to make up the complete block may be assembled in the same way as above described with respect to the blocks shown in FIGS. 1 and 2.

While certain desirable embodiments of the invention have been disclosed by way of example, it is to be understood that the invention is broadly inclusive of any and all modifications falling within the scope of the appended claims.

I claim:

1. A pulley block assembly comprising a shell having at least one mortise for the reception of a pulley, a pulley for each mortise, a pintle pin rotatably supporting the pulley within the mortise, a hanger having opposed legs or straps, and retaining means for holding said pintle pin, hanger and shell in assembled relation, said shell comprising a pair of cheek members, each member being a unitary mass of plastic material, said cheek members being of substantially identical shape and size and each having a relatively thick rim portion bounding a relatively thin panel portion, the rim being widened at the top and bottom of the cheek member to form single spacers at said top and bottom, each spacer being wholly within the circumferential boundaries of the cheek member and projecting from the planes of the inner edge of the rim a distance which is substantially one-half the width of the pulley-receiving mortise, each spacer having therein a closed slot slidably receiving one of said straps without substantial excess, each spacer having means on its inner face for connecting the spacer to another spacer, said pintle pin being supported at each end respectively by one of said hanger straps and cheek members, said cheek members being held in assembled relation by said retaining means and by said slots and hanger, and, in addition thereto, being joined to said assembly solely at the inner faces of said spacers.

2. A pulley block assembly comprising a shell having at least one mortise for the reception of a pulley, a pulley

for each mortise, a pintle pin for rotatably supporting the pulley within the mortise, a hanger having opposed legs or straps, and retaining means for holding said pintle pin, shell, and hanger in assembled relation, said shell comprising a pair of cheek members, each member being a unitary mass of plastic material, said cheek members being of substantially identical shape and size and having a relatively thick rim portion bounding a relatively thin panel portion, each cheek member having a spaced pair of external ribs extending across the exterior face of the cheek member from rim to rim, the rim being widened at the top and bottom of the cheek member to form single spacers at said top and bottom, each spacer projecting from the plane of the inner edge of the rim a distance which is substantially one-half the width of the pulley-receiving mortise, each spacer having therein a closed slot slidably receiving one of said straps without substantial excess, each spacer having means on its inner face for rigidly connecting the spacer to another spacer and being rigidly and inseparably bonded to another spacer opposed thereto, said pintle pin passing through said hanger straps and cheek members between the spaced external ribs of the latter, said retaining means comprising a polygonal end member affixed to said pintle pin intermediate said pair of external ribs of the cheek member, opposed circumferential portions of said end member abutting said ribs so as to limit rotation of said pintle pin, said cheek members being held in assembled relation by said retaining means and by said slots and hanger, and, in addition thereto, being joined to said assembly solely at the inner faces of said spacers.

3. A pulley block assembly according to claim 2 further comprising at least one intermediate member interposed between the cheek members, said intermediate member having a rim portion circumscribing an open space, said rim portion being of substantially the same size and contour as the rim of the cheek members and having a pair of spacers at its top and its bottom, respectively, the spacers of each pair projecting in opposite directions, each to a distance from the plane of the adjacent edge of the rim substantially equaling one-half the width of the mortise, each spacer having means on its outer face for connecting the spacer to another spacer, said spacers on the cheek and intermediate members being assembled in opposite relation and being rigidly and permanently bonded together.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,050,286 August 21, 1962

Donald C. Seamans et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the grant, lines 2 and 3, and 13, and in the heading to the printed specification, lines 4 and 5, name of assignee, for "Boston & Lockport Block Co.", each occurrence, read -- Boston & Lockport Block Company --.

Signed and sealed this 22nd day of January 1963.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents