

configuration, for example, the second pin part may have a transverse cross-section of any non-circular geometric configuration in addition to said star-shape such as fluted, triangular, pentagonal, hexagonal, oval, oblong, straight, crescent, six-pointed star-shaped or the like, it being understood that the number of possible geometric configurations is theoretically though not practically unlimited. The primary advantage afforded by this invention resides in the dissimilarity of the transverse cross-section of the bore and a pin disposed within said bore so that contact surface area is minimized.

In embodiments where the transverse cross-section of the second section of the pinhole or bore is non-circular, the second pin part can have a cylindrical construction and thus has a circular transverse cross-section.

The user feels the tip or Braille dot when the pin is extended, i.e., displaced from its position of repose by an actuated bimorph reed.

The Braille pins may be formed independently of one another as in the prior art or they may be formed innovatively in connected relation to a common structure so that one set of connected Braille pins is adapted to fit within one Braille cell. In the latter embodiment, eight Braille pins are releasably connected to a common neck that extends from a base so that individual pins of the set of connected Braille pins are detachable from said common neck after being collectively placed into respective pinholes of a Braille cell. More particularly, the Braille pins can be molded with a breakaway membrane to greatly reduce the time required to load individual pins. This enables each set of eight (8) Braille pins to be inserted into a Braille cell at one time. Therefore, instead of individually loading one hundred sixty (160) pins into one hundred sixty (160) bores, an assembler performs only twenty (20) assembly operations. Thus, the same number of pins is installed in one-eighth as much time.

In a variation of each embodiment, the second part of the Braille pin is circular in transverse cross-section and the first and third parts have transverse cross-sections of any predetermined geometrical configuration. In this variation, the transverse cross-section of the second section of the pinholes or bores that slidably receives said third part may have any non-circular configuration.

It should be understood that the respective transverse cross-sectional shapes of the non surface-bearing parts of a pin, i.e., its first and third parts, have no substantial effect on the performance of the pin. Again, the transverse cross-sectional shape of the second part, the surface-bearing part, is the cross-sectional shape that most affects the performance of the pin.

In all embodiments, the increase in breadth of the second section of the bore relative to the breadth of the first section creates an overhang that substantially prevents debris or other contaminants from reaching the bearing surface of the pin.

Moreover, the mismatching of the respective cross-sections of the respective second parts of the Braille pins and their associated second sections of the pinholes or bores reduces the area of surface contact between said second pin parts and said second bore sections, thereby enabling operation of the Braille pins even when the pin bores have been contaminated by debris.

More particularly, the contact points where the non-circular second part of a pin frictionally engages a circular second section of a bore (or where a non circular second section of a bore frictionally engages a cylindrical second part of a pin) may form a knife-like edge. Large voids between the bore contact or bearing surface (the sidewall of

the second section of the bore) and the pin body (the hub from which the fins or projections radiate) provide a path for debris to pass through while avoiding the sensitive bearing surface.

The invention in broad form is thus understood to include a novel Braille pin having a first part with a transverse cross-section of any predetermined geometrical configuration and a second part having a transverse cross-section of any predetermined geometrical configuration where the second part has a breadth greater than a breadth of the first part. A first shoulder is formed at a juncture of the first part and the second part. A bore slideably receives the Braille pin and said bore has a first section for slideably receiving the first part of the Braille pin with a first clearance and a second section for slideably receiving the second part of the Braille pin with a second clearance. The second section of the bore has a transverse cross-section substantially different from the transverse cross-section of the pin second part. The first clearance is greater than the second clearance. The second section has sidewalls that define a bearing surface for the second part of the Braille pin and an overhang is formed at a juncture of the first and second sections. The overhang limits travel of the Braille pin when the first shoulder abuts the overhang.

An important advantage of the novel bore construction is provided by the overhang that provides an unobstructed path of travel for debris to fall through, thereby minimizing the probability that debris will foul the critical bearing surface.

An important advantage of the novel pin construction resides in its ability to continue to operate even when the pinhole or bore is contaminated with debris.

Another closely related advantage of the novel Braille pin is provided by the reduced-in-area surfaces of contact between the pin's second part and the bore's second section which minimizes the probability that debris will be trapped between the second part of the pin and the bearing surface of the bore.

Still another advantage is realized by the reduction in assembly time made possible by the provision of a base and neck to which is releasably mounted a plurality of the novel pins.

The aforesaid advantage also facilitates the manufacturing of the Braille pins in that it is easier and more economical to manufacture sets of eight (8) interconnected Braille pins than it is to manufacture said Braille pins individually.

These and other important advantages and features of the invention will become clear as this description proceeds.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts that will be exemplified in the description set forth hereinafter and the scope of the invention will be indicated in the claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the invention, reference should be made to the following detailed description, taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a set of four (4) Braille pins of a first embodiment of Braille pins that share a common construction and differ from one another only in the length dimension;

FIG. 2A is a perspective view of a plurality of Braille pins of a second embodiment that are interconnected to one another by a neck member to facilitate manufacturing of said Braille pins;

FIG. 2B is a top plan view thereof;