

READING MACHINE FOR THE BLIND

It is to be understood that the word "characters" as used herein connotes and includes not only alphabetical letters in any and every language as well as numerals of all kinds and symbols consisting of such various text symbols as commas, semi-colons, colons, parentheses, quotation marks, punctuation marks of all kinds, mathematical and chemical symbols and the like which are commonly used and found in printed, graphic or otherwise produced or reproduced matter. Further, it is to be understood that the word "delineated" as used herein in reference to characters includes printed delineations employing printer's inks, paint or other pigments, chalk, crayon or other marking substances whereby color contrasting matter can be exhibited.

Reading machines for the blind which have heretofore been conceived are, in general, incapable of mobility and do not afford rapid and facile tactile sensing. Moreover, prior machines of this general character are incapable of presenting more than one individual character at a time which raises a serious problem for the blind person of remembering and retaining the individual characters for subsequent recall and assimilation. Our present invention is directed to the provision of mobile equipment which obviates all of the disadvantages of prior reading machines for the blind, and which is easily operable and capable of assembling a series of replicas of delineated characters at substantially the same time for ready tactual sensing.

Our invention, in general, relates to the art of reproduction and more particularly relates to combined photoelectronic and electro-mechanical means for producing replicas of delineated characters in any work upon an operator-controlled moving belt for tactual sensing.

A primary object of our present invention is to provide an improved reading machine for the blind which is positive in operation; which may be easily operated under the sole control of a blind person; and which enables ready tactual sensing of a succession of assembled replicas of delineated characters contained in any work in any language.

Another important object of the invention is to provide an improved reading machine for the blind of the indicated nature which is additionally characterized by its simplicity of construction, operation and maintenance and consequent inexpensive manufacture with low cost to maintain.

A still further object of our invention is to provide an improved reading machine for the blind of the aforementioned character which is sanitary as well as safe to use by a plurality of different blind persons.

Another important object of the invention is to provide equipment of the aforementioned character which enables blind people to read current news media, magazines and other works and which does not require the employment of Braille or other special type for tactual sensing.

Other objects of the invention, together with some of the advantageous features thereof, will appear from the following description of the best mode of construction thereof and the manner of using the invention, as illustrated in the accompanying drawings. It is to be understood that we are not to be limited to the precise embodiment thereof nor to the precise components or arrangement of the components as shown since the invention as defined in the appended claims is intended

to cover the embodiment illustrated as well as modifications thereof within the purview of our concept.

Referring to the drawings:

FIG. 1 is a top plan view of a perforated endless belt component of an embodiment of our invention, as mounted for rotation, part thereof being broken away to illustrate an underlying drive belt and hopper for carrying replica building spheres.

FIG. 2 is a fragmentary side elevational view of the housing and supported components shown in FIG. 1, this view also schematically illustrating in dotted lines one of the actuatable solenoids and in solid lines its armature for controlling the retention and periodic release of balls from the outlet of each hopper compartment for reception in the perforations of the endless belt.

FIG. 3 is an enlarged fragmentary side elevational view of portions of the lower reach and upper reach of the perforated belt component shown in FIGS. 1 and 2; this view also showing one of the partially filled compartments of a ball-retaining hopper with a dotted line schematic showing of one of the actuatable solenoids controlling the retention and release of balls from the hopper onto the lower reach of the endless belt component of the machine, and also illustrating a portion of a drive belt in underlying engagement with the upper reach of the belt and in overlying engagement with the lower reach of the endless belt for temporarily retaining the balls in the perforations of the endless belt for tactual sensing.

FIG. 4 is an enlarged fragmentary elevational view of the outlet end of a compartment of the ball-retaining hopper arranged in close proximity to the lower reach of the perforated belt component of the machine and illustrating one of the actuatable solenoids employed, this view showing the armature of the solenoid in extended position to retain the balls in the compartment prior to energization of the solenoid.

FIG. 5 is a view corresponding to FIG. 4 but with the armature of the solenoid retracted to allow release of balls from the hopper and reception thereof on the lower reach of the endless perforated belt.

FIG. 6 is a top plan view of the portable machine of our present invention with the principal components comprising the work holder, the scanning mechanism and the endless perforated belt at rest positions and in their relative assembly to one another as embodied in our present machine.

FIG. 7 is a side elevation view of the machine shown in FIG. 6, part of the casing being broken away to illustrate a portion of the drive means for the scanning mechanism; this view illustrating the movable mounting of the work holder and schematically illustrating a control dial for adjusting the work holder in relation to the scanning mechanism for line to line scanning of the delineated characters in works having different number of lines of characters per inch.

FIG. 8 is an elevational view of the mechanism for controlling the motion of the scanning unit in either direction by the selective engagement of the shoes shown in FIG. 9 into one or the other of the counter rotating belts.

FIG. 9 is an enlarged exploded detail of certain of the elements contained in the scanning drive mechanism.

FIG. 10 is a fragmentary end elevational view of the mechanism illustrated in FIGS. 8 and 9.