Braille Embosser for Imprinting Braille

1. Technology:

The problem for which solution was researched. High cost of braille embossers and absence of their availability in India. The invention namely the solution to the problem.

The embossing mechanism makes use of series of multiple embossing pins mounted to the eccentric shaft of their respective stepper motor which operate the pins via scotch and yoke mechanism. Thus, one pin and one stepper motor make a single unit of embossing mechanism. When these embossing units are arranged, alternatively, in their respective mounts they make up the embossing array. These individual sets of stepper motor and embossing pin act as a die for imprinting braille on paper. The pin retract and extend as per the requirement of embossing i.e. when an imprint is required, the pin will extend and when it is not, it will remain in retracted position. The embossing array is held by a support structure which runs from one end of the printer to the other end. The support structure is itself driven via by a stepper motor. Its function is to lift the array up and down i.e. to drive the array structure to do the imprinting. We call it the 'array driving mechanism'.

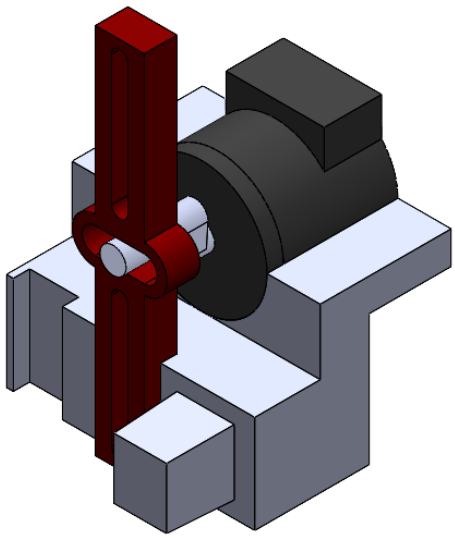

Fig. 1 Single unit of embossing mechanism

2. Problem Addressed:

The existing technology and products available in the market which generate braille script are largely unavailable, especially in India and they come at a humongous cost which is one of the main reason that the existing technology to generate braille is not prominent. The high cost is the result of embossing mechanism used in the desktop braille embossers. Their technology is based on solenoids or pneumatic actuation.
Since the market for desktop braille embossers in highly niched, the low amount of demand does not make it possible for manufacturers to adopt for mass production techniques which would cut the costs (in terms of manufacturing) of these devices substantially. Hence, this positive feedback loop of low demand-high price-less availability results in dead end in mass innovation of this sector.

Technologies other than braille embossers like braille type writers and manual braille embossing which provide home based braille solutions are severely outdated resulting in errors and slow braille production. Refreshable braille displays or RBDs is a newer technology in this arena but its again limited by its high cost due to costly actuation mechanisms.

3. Industrial Applications:

Primary application of our product is embossing dots onto a paper to create braille characters/script and tactile graphs or shapes. Thus, the main commercial application is the design and fabrication of braille embossers (braille printers). Also, by changing the arrangement of the embossing pins in the array, different embossing patterns can be achieved. Therefore, secondary application is the embossing of general patters onto a surface by changing the configuration of the array.

4. Patent Application Number: 202441007943