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Manual applicator road marking machine: A review

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ABSTRACT

This paper summarizes the ongoing researches about the road marking and devices used in road marking. Road marking machines are widely used for marking purpose essential for road safety and traffic control. Various types of road marking devices as fully automatic road marking machine, semi-automatic road marking machine, manual road marking machine, etc. are available in the market. Automation in road marking has evolved and developed with time but mostly in India, manual applicator road marking machine has a great impact in road marking operations due to its size, ease and lower cost. Various types of materials such as thermoplastic, traffic paints, epoxy, etc. are used as marking materials by calculating desirable properties. Horizontal, vertical and straight line marking is possible by manual applicator road marking machine.

Keywords— *Road Marking, Road marking Devices, Manual Applicator Road Marking Machine*

1. INTRODUCTION

Road marking is essential for controlling and guiding traffic. In urban areas where traffic rate, intersections are higher, road marking plays an important role as a source of information and indications for the users which describes the pathway and helps to convey messages in the form of signs and signals. These are also used for regulation and warning purpose which is clearly visible and easily studied.

Stefan Vacek, Constantin Schimmel, Rudiger Dillmann [1] in their work about road marking analysis for autonomous vehicle guidance describes the importance of road signs and signals, lane marking, lane detection, lines used in lane markings. The arrows being used, their design and structure, classification and other all factors are considered while marking signs on road. Their work provides us with the information necessary for road geometry, arrows, and lines being used. Conclusion of their work is that approach for road marking analysis is divided into two parts that is. lane border markings and painted arrows.

Road marking can be done by considering primary measures about road safety. For this, appropriate marking, as well as its proper detection, is required. Thomas Veit, Jean Tarel, P. Nicolle and P. Charbonnier [3] works on evaluation and road marking features extractions. Their work provides a systematic approach to evaluate the specific algorithm for extracting features about road marking from images. Three important steps which include road marking features extracting, geometric model estimation and geometric model tracking parameters along with an image sequence are explained in their work.

Conclusion of their work is that the algorithm provided is used to sample the state of art in road marking detection. Also, experimental work proposed by them showed that photometric selection must be combined with a geometric selection so that road marking can be done correctly.

In this way, various approaches are made to perform road marking by considering all the essential parameters with the help of appropriate device and material.

2. ROAD MARKING DEVICES

Road surface marking devices are used to convey official information about road signs and safety by marking specific indications. Standardization and uniformity in marking is an important factor of minimizing uncertainty in meaning. Various types of road marking devices are available as manual, semi-automatic and fully automatic road marking machine. R. Deepak Kumar, S. Pradeep, M. Navin Prasad and S. Shankar [2] works for semi-automatic road marking machine. Their work provides the detail about machine setup, working and design specification and also fabrication processes. It also proves that the usage of a pneumatic component leads to reduce cost and provide better performance. The requirement of human power can be overcome by providing automation in the machine. The setup developed is capable of performing four different processes that are (1) Drilling of hole on the road; (2) filling up of hole with strong adhesives like epoxy resins; (3) placing of road studs from the hopper storage such that their legs are into the holes and (4) stamping of studs to fix it tightly on roads. The setup is divided into two parts that is. mechanical and electrical one. Both setups works to complete all four processes. Conclusion of their work is that by using Semi-automatic machines for road marking leads to reduce cost and remove the shortage of manpower. Also, efficiency in-laying of road reflector studs get increased.

Mr K. S. Hanumanth Ramji, S. Suresh, M. S. Nixon and S. S. Rajan [4] in their work on automatic road stud installation and pavement marking machine provides the detail of the design of the machine and suggest the methodology for fabrication. Their work thoroughly explains the devices available for road marking and focuses on automation techniques more. It also explains the methodology to be employed and working principle of the machine. Conclusion of their work is that the automation process proves to be cost effective without harming the performance of the machine. The system reduces the manpower shortage in the field of public works department.

J. Naveen, M. Hari Sudhan, C. Karuppaiah and A. Flavin Raj [5] works on design and fabrication of low-cost road marking machine. Their project is based on a fully mechanized process where they have fabricated and designed mechanism for road marking machine which uses the application of forces for spraying the paint on the road. They use a frame to support the whole arrangement made up of mild steel. Also, various arrangements are made for spraying paint. The main purpose is that the cost of the machine, as well as work of labour involved, should be reduced and to carry out a revolution in road marking domain. Though automation introduced in road marking devices, sometimes manual applicator machine is found to be better to use also by proper designing it, the machine can be operated by one or two people only.

3. ROAD MARKING MATERIAL

The material used in road surface marking is used to convey official information. Thermoplastic road marking paint is a kind of powder paint used in marking. The paint is applied on the road surface by spraying and later it is allowed for cooling. The paint should be wear-resisting, thick, bright and reflective. Various researches are carried out to decide the essential parameters of road marking material. Sheikh V. Rehman and A. K. Duggal [6] works to find the suitability of different materials used in road marking process. The aim of their work is to study various types of rod markings available and to assure the extent of usage of each type and to compare the suitability and economy of these materials in terms of resistance, service life, luminance nature and reflectivity. Their work and proposed study help in reducing the cost and to improve the life span of road marking material. Various factors like thickness of marking, Indian environmental and traffic condition are also responsible to decide the properties of the material used in road marking purpose.

Geometrical parameters, safety in traffic, etc. are the primary objectives while selecting marking material. T. V. Dormidontova and A. V. Filatova [7] in their work research of the influence of quality of material on a road marking of highways, gives us the information about the influencing material quality required in marking. Their work describes the parameters of criteria of selection of efficiency of road, quality of materials, fluorescent nature of the material and many more. Conclusion of their research is that road enamels found to be the most accessible material for marking of road. Also, service life, cost, utilization and safety features all get fulfilled by this material use.

4. CONCLUSION

By results of this reviews following conclusions have been formulated- (1) at present, automatic road marking machine is mostly used for marking since it reduces the manpower shortage and improves the efficiency of the machine. (2) Suitable marking material is selected so that all the necessary requirement of road safety, environmental factors and others can be fulfilled. (3) Manual applicator road marking machine is also considered where smaller roads, low equipment cost, etc. factors are essential. Also, certain variation in design leads for better result of this machine.

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