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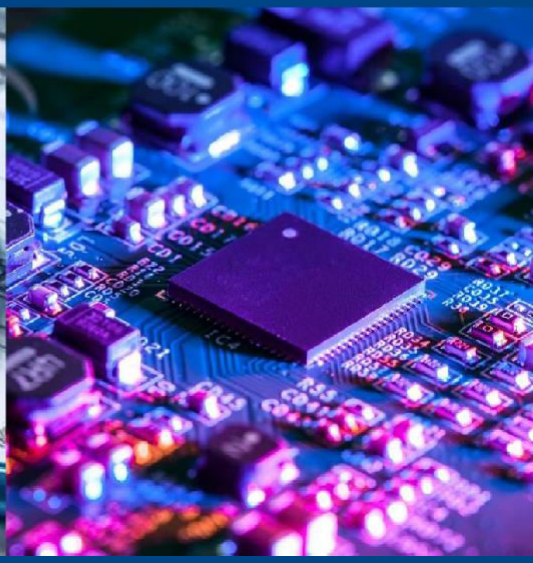

International Journal of Multidisciplinary Research in Science, Engineering and Technology

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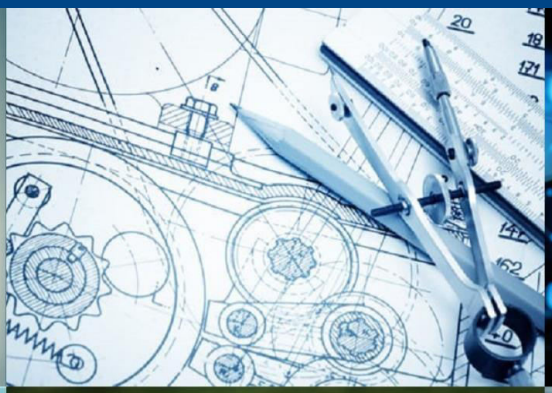

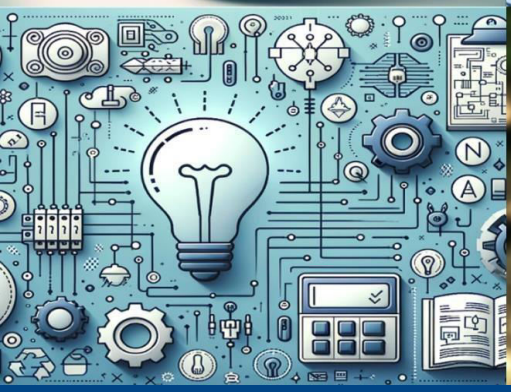

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Integration of Chilled and Steam Bath

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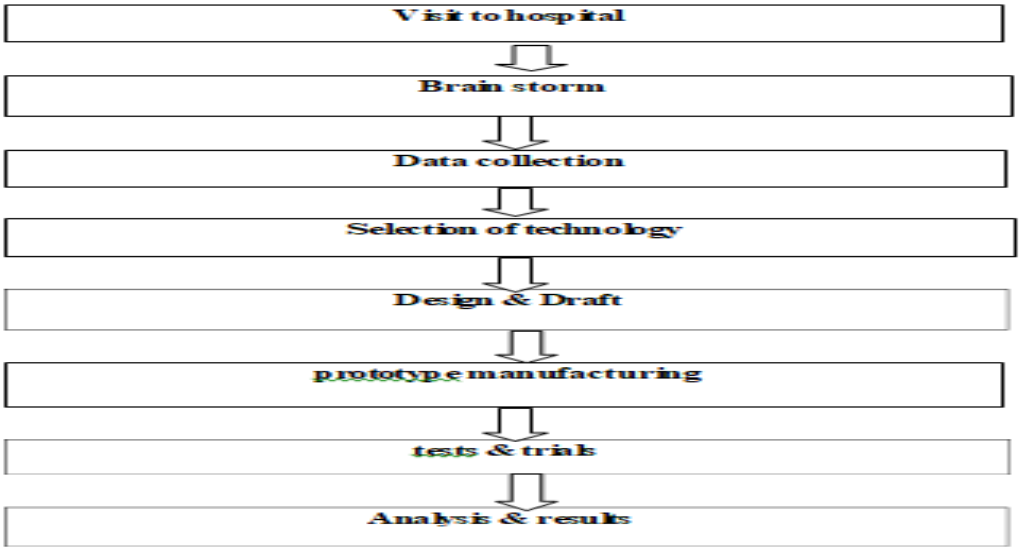
ABSTRACT: Currently, athletes are experiencing injuries and muscle damage. Also, due to increasing pollution, their endurance stamina is decreasing. The Atharvaveda and Ayurveda offer solutions for treating these issues, with one being steam baths and ice baths. Although the concept of steam baths is available,the scientific community doesn't recognize "chilled vapour baths" as an existing modality. Instead, current practices involve using a mixture of water and ice or taking a dip in cold water (with a temperature of 10° to 0°). This method requires a substantial amount of water and ice, making it expensive to use. We have developed a solution, a chilled vapour bath, that offers the same recovery benefits as ice baths but with a more cost-effective and efficient approach. This saves both water and time. Steam baths and cold vapour baths are not integrated; instead, we have combined these two modalities into one system. This eliminates the need for athletes to go to separate locations for each type of bath. The cost of using this combined system is affordable for everyone.

I. INTRODUCTION

In today's hectic life, the body becomes fatigued after working 8-hour shifts. Similarly, athletes experience external injuries such as sprains, swelling, bruises, and postcompetition pain. Additionally, after accidents, when a body part is injured and subsequently casted, the muscles become stiff after the cast is removed. To restore them to their original condition, both steam baths and ice baths are needed. Historically, these remedies were provided in Aayurveda. Doctors and physiotherapists still recommend these treatments to patients. These natural remedies have no side effects and help reduce pain and injuries quickly. Steam baths provide relaxation and reduce stress, while also improving blood circulation and boosting the immune system. Currently, according to information available, steam baths and ice baths are provided using two separate devices. Ice baths traditionally involve the use of water and ice. We have combined these two devices into one. Furthermore, instead of using water and ice in the ice bath, we have installed a VCRS (Vapour Compression Refrigeration System), and named it a "Chilled Bath." This provides both treatments in a single piece of equipment. This innovation saves water, electricity, time, and money, while still providing the same therapeutic benefits.

II. EXPLATION METHODOLOGY



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IV. RESULT AND DISCUSSION

The prototype successfully combined steam therapy and chilled bath in a single unit. The system was tested for a hand-sized chamber and delivered controlled hot and cold treatment in separate cycles. Steam was generated quickly, reaching temperatures of 40– 45° C, while the chilled bath lowered the temperature to 10– 0° C using a VCR system with R134a refrigerant.

During testing, the system maintained temperature stability and showed good results in reducing swelling and pain. Power consumption remained within limits, making it energy-efficient. The prototype was user-friendly, safe, and cost-effective, with potential use in medical rehabilitation, sports recovery, and personal therapy

V. CONCLUSION

The Steam and Chilled Bath Chamber is an innovative and dual-function therapy system that integrates both hot steam therapy and cold therapy in a single unit. By utilizing a vapor compression system for chilling and an electric steamer for heating, the project ensures precise temperature control and efficient operation. The system is particularly beneficial for pain relief, muscle relaxation, improved blood circulation, and skin detoxification, making it ideal for medical, physiotherapy, sports recovery, and wellness applications. The use temperature controllers ensures accurate monitoring and safety mechanisms prevent overheating or excessive cooling.

Currently, the prototype is designed for a single hand, but if successful, it can be scaled up to accommodate full-body therapy. This makes it a versatile and scalable solution for a wide range of users, from athletes and physiotherapists to spa and wellness centers. In conclusion, this project demonstrates a cost-effective, energy-efficient, and safe approach to combining heat and cold therapy, offering a valuable contribution to health and wellness technology. Future enhancements may include automated control systems, IoT-based remote monitoring, and a full-body chamber design for wider applications.

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