Cool Car Technology

Repeatable Vehicle Color Change

Enabling colorful times

Evolution is constant

Years 1885-1886

Year 2017

Patented concept

Concept explained

Install vest to each panel

1) Any surface, such as a car surface, will be given a transparent vest sort of a jacket which has a thin space to hold the paint fluid of any color.

2) A regular car has about 13 exterior panels. Each panel will be provided with such a vest.

3) There will be inlet and outlet micro valves for each vest, covering a surface or panel.

Zip zap zoom change color

1) Old anti-freeze paint can be easily drained through the outlet valve of the vest.

2) The insides of the vest will be cleaned and dried.

3) New anti-freeze paint of a chosen different color, from a palette of 1000's of colors, is injected into the vest covering the surface through the inlet valve.

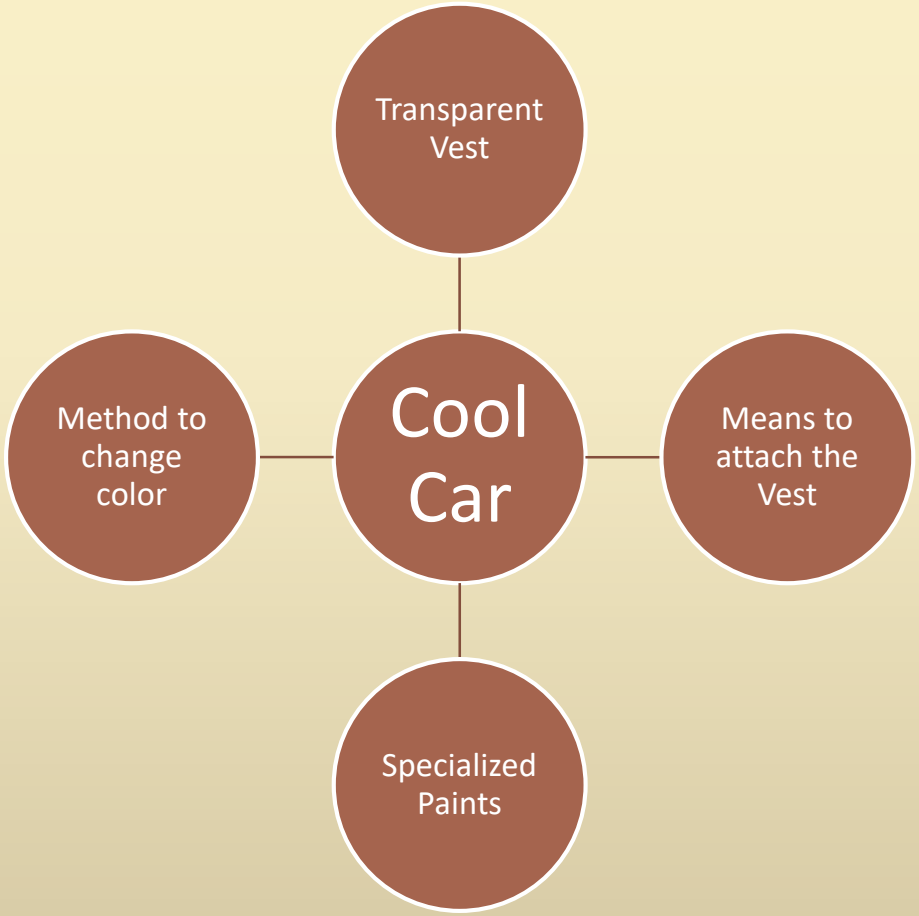
4) The above color change process will be completed automatically, in robotic color change stations in under 15 minutes.

Other applications

1) Such a method can further be extended to any surface. We believe, the core application is in the automobile passenger car segment.

2) However, other applications include two wheelers, hand held devices, electronics, appliances, furniture, shoes, decorative show pieces and even house or office walls.

Concept requires:



- The Color changing concept for Cool Car requires:
  - A transparent vest to create an enclosed space.
  - Simple, effective techniques to attach the vest to the car surface.
  - Specialized paints which remain in fluid form (e.g., anti-freeze added) which could be injected into (and / or drained from) the enclosed space of the vest.
  - Equipment to change color of the car. These could be:
    - Manual systems
    - Automated Robotic system

Materials for vests

compressively retaining an extension extending from the edge of the vest between the vehicle surface and an adjacent object, or combinations thereof.

9. The system of claim **1**, wherein the fluid-tight space comprises a thickness ranging from 1 micron to 5 millimeters.

10. The system of claim **1**, wherein the vest is at least partially formed from polyester, acrylic, fiberglass, polyethylene, plastic, silicone, polypropylene, polystyrene, polyester, glass, fiber, thermoplastic, thermoset, latex, polymer fibers, polyvinyl chloride, polyethylene terephthalate, nylon, vinyl, thermoplastic materials, thermoset materials, phenolics, furane resins, amino resins, epoxy, alkyds, allyl plastics, aminos, polyamides, polyethylene resins, polycarbonate, acrylic resin, cellulose acetate, cellulose nitrate, cellulose acetate butyrate, cellulose propionate, rubber, neoprene, Thiokol, nitrile, butyl rubber, silicone rubber, acetals, cellulosics, fluoroplastics, ionomers, polyimide, polyolefins, polysulfone, composites, polythene, epoxides, polyurethane, synthetic rubber, synthetic plastic, synthetic resin, or combinations thereof.

11. The system of claim **1**, wherein the vest comprises an interior adjacent to the fluid-tight space, and wherein the interior comprises a hydrophobic coating adapted to facilitate removal of visible media from the fluid-tight space

securing an extension extending from an edg the vehicle surface by welding, laser welc welding, heat sealing, heat fusion, crimping, ing, adhesives, pressure-sensitive adhesives sives, hot adhesives, hot gas welding, in receiving at least one fastener, compressive extension extending from an edge of the ve vehicle surface and an adjacent object, o thereof.

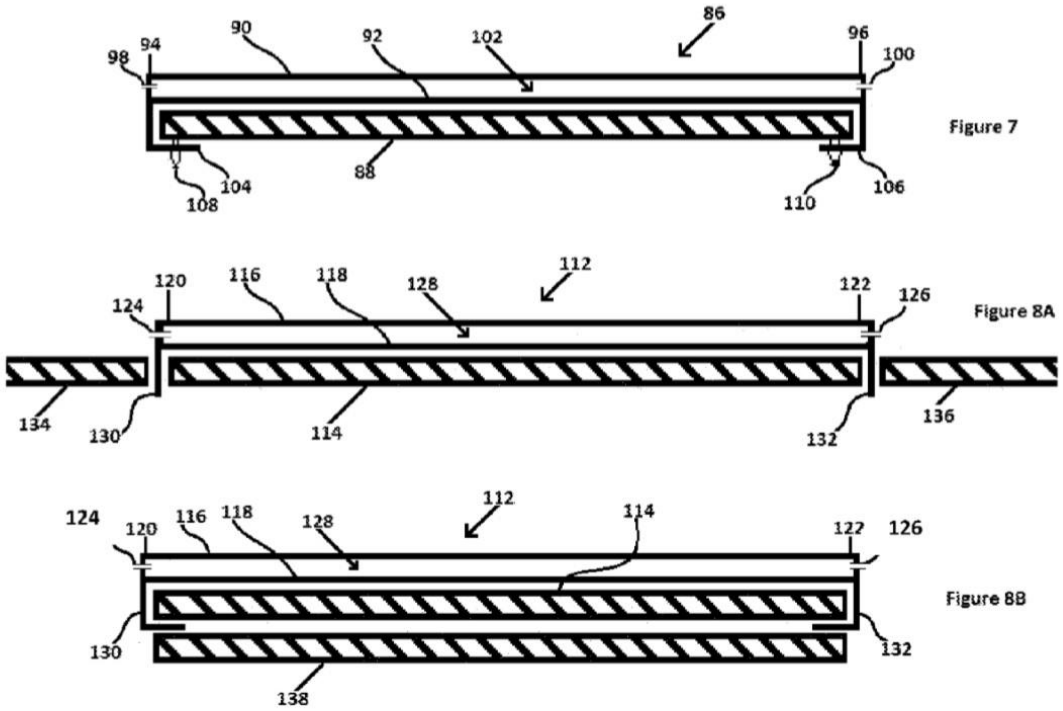
19. The method of claim **16**, wherein the s the vest into association with the vehicle su spacing the exterior side of the vest from millimeters from the vehicle surface.

20. The method of claim **16**, further comp removing the first visible medium from space through said at least one port; and providing a second visible medium into space through said at least one port.

21. The method of claim **20**, wherein the s the first visible medium from the fluid-tight s flowing a wash fluid through said at least o fluid-tight space to displace the first visible m first visible medium, or combinations thereo the wash fluid from the fluid-tight space thro

- Vests are transparent and made out of plastics, polymers or composites.
- Vests we create for car body panels will be flexible, stretchable, rubbery and will conform to any shape or contour or form as needed with all the desired properties.
- Vests when attached to any surface form a snug fit (Hand in glove fit).
- Current day Material Science is very advanced and can deliver all these requirements.

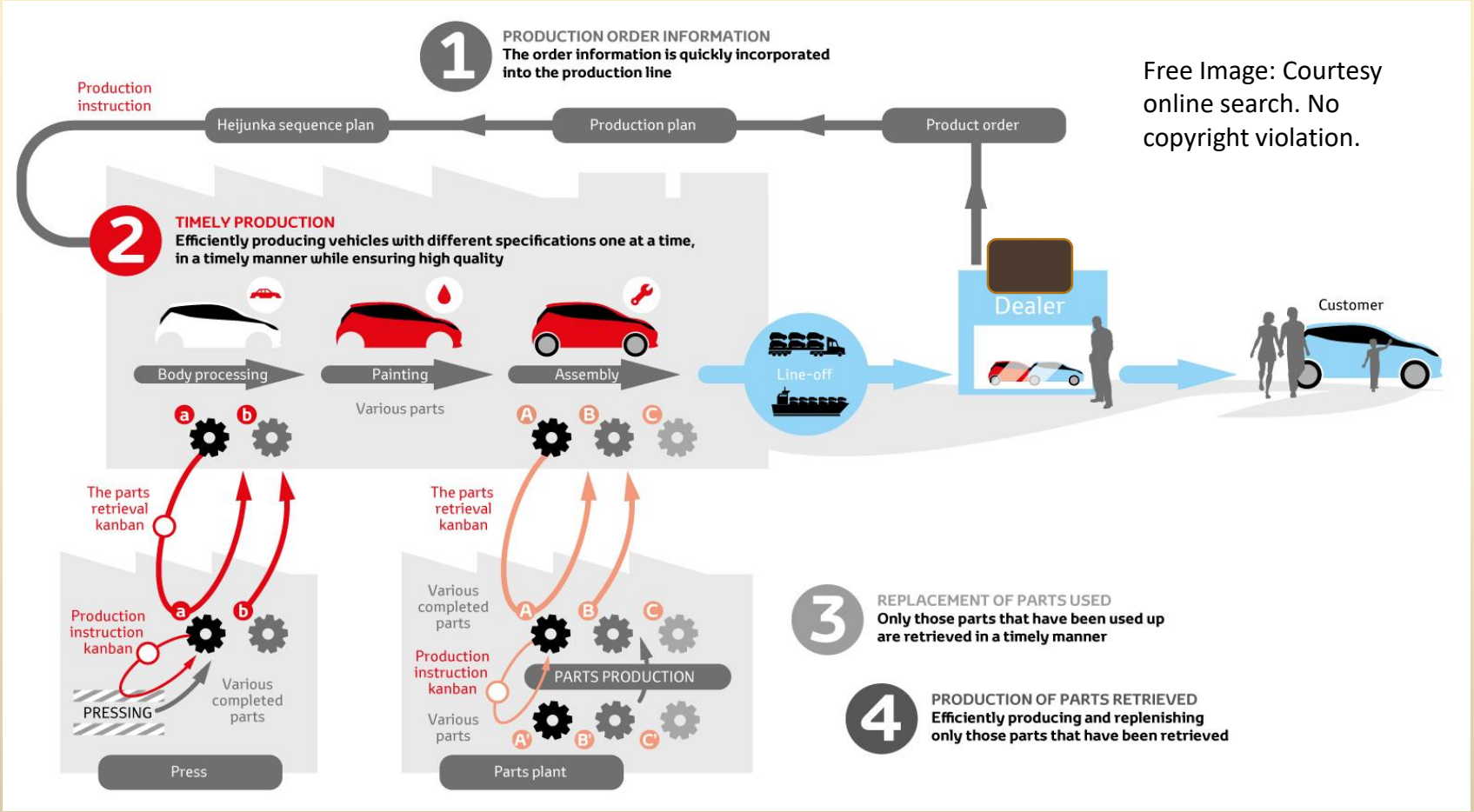
Methods of securing a vest



- Note that the two layered vest has micro valves / ports as inlet and outlet ports for paint / colors.
- Attached image shows a two layered vest secured to a surface by three simple fastening techniques.
- Figure 7 shows the vest edge secured to the surface by fasteners.
- Figures 8A and 8B show the vest edge secured to the surface by an adjacent object.

Automobile Industry simplified

Typical automobile manufacturing



Free Image: Courtesy online search. No copyright violation.

- The image shows the current day automobile manufacturing process steps.
- Involves a sequence of steps from the press shop, body shop, paint shop, assembly line where in two lines trim line and frame line run parallel to come together in the end cab-deck assembly point which further gets assembled to the chassis, to roll-off.
- The line-off process is the distribution step to deliver cars to the dealerships.

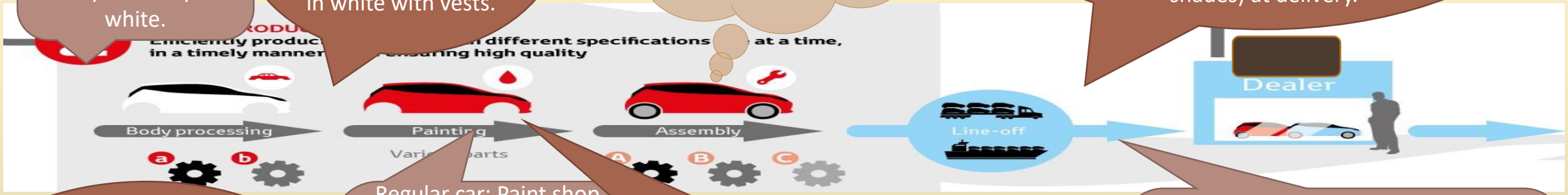
Automobile manufacturing
Regular car Vs Cool car

Regular car: Body shop assembles the car body panels except for doors. They are body in white.

Cool car: Body shop assembles the car body panels with vests installed on them. They are body in white with vests.

The assembly line process remains the same. Trim line, Frame line and assembly to chassis.

Cool car: The line off process is completely simplified and made inexpensive. The order, inventory, transportation and delivery management is ONLY by car models and not by colors. The cars delivered as body in white with vests. Dealer injects customers choice of color (from a 1000 shades) at delivery.



For a cool car: In the press shop stage, the pressed body panels, will have the corresponding vests installed. In some cases manufactured and installed.

Regular car: Paint shop paints each car with an individual color. Begins with protective coats, followed by 5 to 8 other coats. Need 1000's of liters of paints by each color. Very expensive installation and material costs.

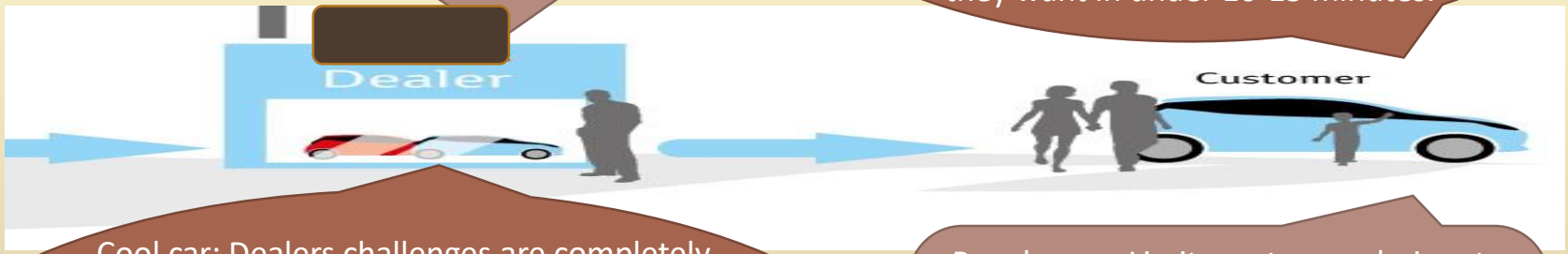
Cool car: Paint shop is entirely eliminated. The body in white with vests can directly move to assembly line. The protective coats to the sheet metal would be transferred to the suppliers manufacturing process.

Regular car: The line off process has elaborate order, inventory, transportation and delivery management by car models and by colors, to each individual dealerships. Very expensive, complex management and limits customer choices (to 4-5 colors) and delays in delivery.

Automobile manufacturing
Regular car Vs Cool car

Regular car: Dealer has multiple challenges in maintaining inventory at his dealership, by car models and by colors. Its huge investments and expensive procurement and parking costs. Impacts his profitability negatively. Further, cannot respond to customer demands of special colors.

Cool car: Customer choice is unlimited. A full color catalogue with 1000's of shades could be presented to the customer to choose a color from. Dealer injects customers choice of color, and a happy customer drives away. And Customer can change color whenever they want in under 10-15 minutes.



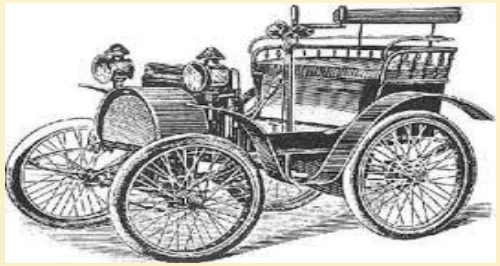
Cool car: Dealers challenges are completely minimized. He just has to maintain inventory by car models and not by colors. His costs of inventory, procurement and parking costs are reduced if not eliminated. Increased profitability for dealers. And he can inject any color of customers choice from a palette of 1000's of shades.

Regular car: Limits customer choices to 4 or 5 colors offered by car model. Cannot get a specific color of choice, outside the 4 or 5 colors. Special orders have long wait times. Customer not fully satisfied with purchase. And he cannot change color of the car.

- As you can see, automobile manufacturers and dealerships benefit significantly by cutting various costs, eliminating overheads, simplify manufacturing, supplying, delivering processes and deliver increased customer satisfaction, by switching from making regular cars to cool cars.
- In particular, inventory management, transportation, distribution, manufacturing and painting costs are significantly reduced, if not eliminated.
- Vests manufacturing and installation will be brought and integrated into the JIT (Just in time) process.

What does this
mean to the world?

What does it mean to the World? Against various parameters



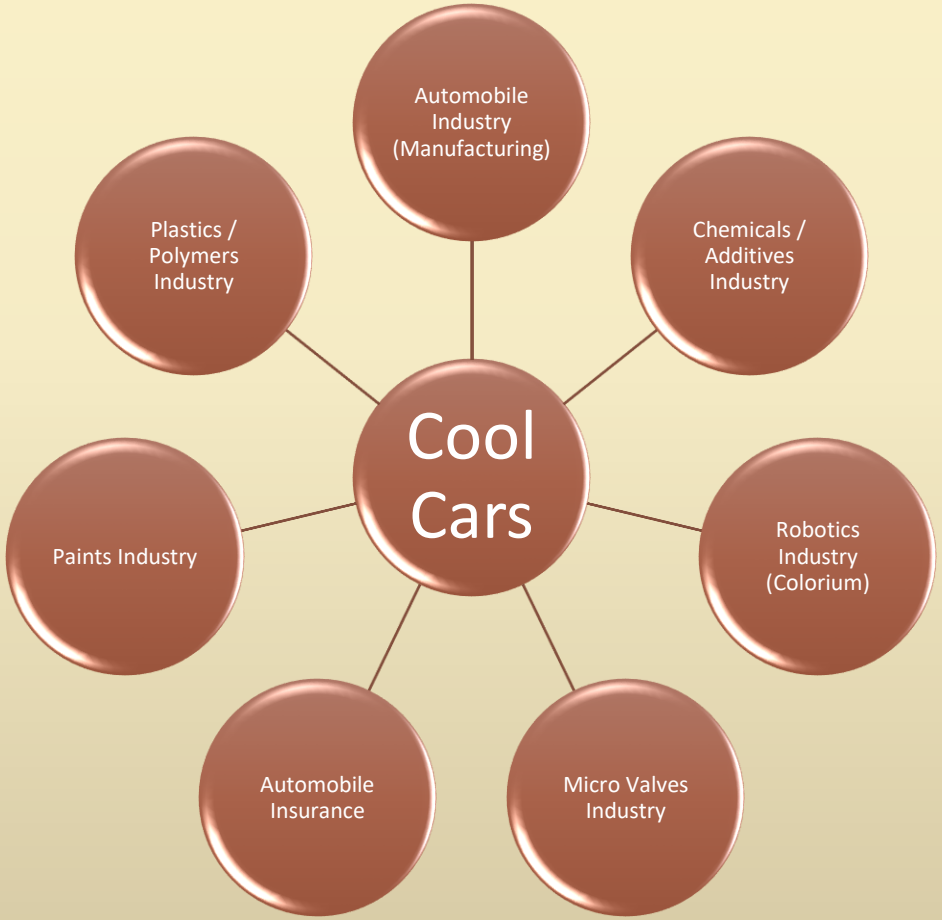
Automobile industry parameter	Current car industry	Cool car solution
Fixed manufacturing plant cost	High	30% lower
Transportation costs or Operational costs	High	Significantly reduced, simplified and streamlined
Inventory management	Complex, by color	Completely simplified and streamlined
Dealership stocking	Complex, by color	Completely simplified and streamlined
Unit painting cost	$ABC	10 to 15% lower
OEM profitability	Current profit	25% to 40% higher profitability
Repainting cost	Exorbitant and non-repeatable	Affordable and highly repeatable
Consumer expression	Limited to no expression change	Can be as expressive as the consumer wants
Color change at will	Not possible	Totally possible - done under 15 minutes
Surface finish, texture, touch and feel change	Not possible	Totally possible - vest replacement - a days job
Match car color to outfit for party	Not possible	Totally possible - match in 15 minutes
Creative coloring	Not possible	Any combination of colors can be used. E.g., India flag colors, doors in one color, bonnet and bumpers in another color.
Accident diagnostics and forensics	Difficult but doable	Impact reconstruction is simple and easy
Impact to economy (national and global)	Normal status quo	Significant positive boost for economic growth
Promotes and encourages small businesses	Normal status quo	Plenty of opportunities for small and new entrepreneurs

What does it mean to the World? Against various parameters

Based on the benefits listed, I predict that the automobile industry will readily evolve and adopt this next generation solution and build 'Cool cars'. Further, the solution delivers a boost to the industry economics. My prediction is that 90% or more of the passenger car market will migrate to this 'Cool car' solution within the next decade. A small percentage may remain in current method of painting e.g.: One plant by manufacturer continue to use conventional paint. Further, the solution may be adopted by a small percentage of commercial vehicle segment of automobiles as well.

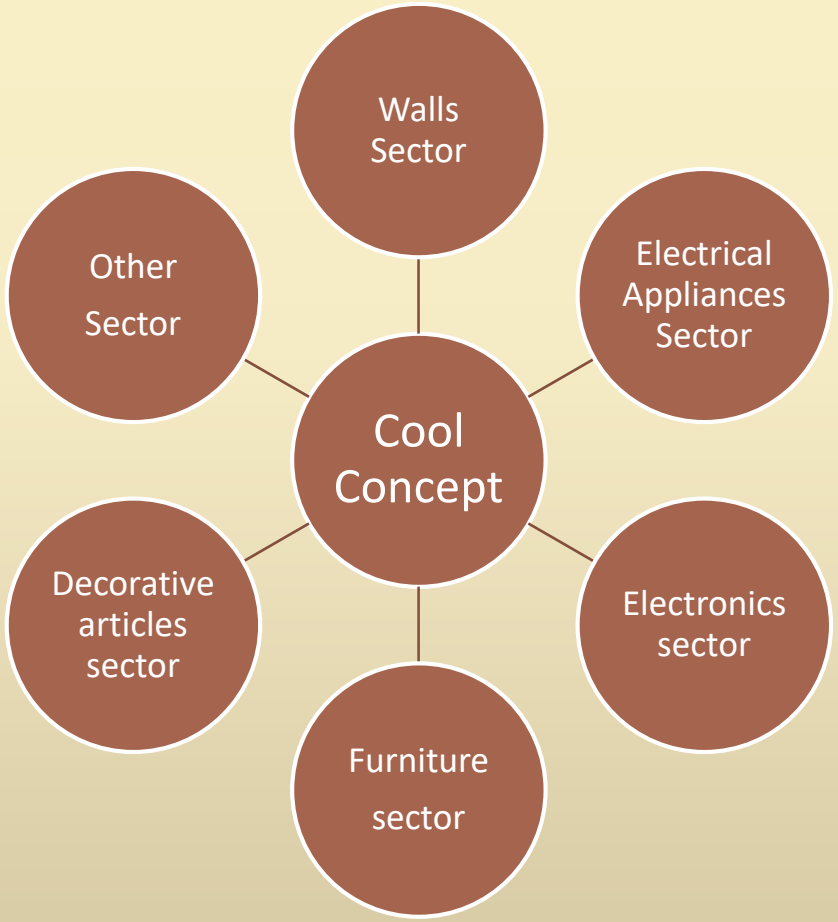
Automobile industry parameter	Current car industry	Cool car solution
Global energy balance	Normal status quo	Much better. Crude consumption increases, encouraging alternate energy sources to be used to run the cars. E.g., success of electric cars, hybrid cars.
Impact to automobile industry	Normal status quo	Very positive. Cuts plant cost, painting costs, transportation costs, provides significant cost savings, improves profits, improves customer satisfaction, streamlines the business processes and steps.
Impact to world	Normal status quo	Very very positive. Global economics, regional economics and individual country or national economics would all be stimulated for growth, jobs and businesses would be created and the world would improve for better. Global trade would receive significant boost.
People sophistication levels	Normal status quo	Will improve profoundly. As robotics comes into mainstream across the world, for changing car colors.
Downstream businesses	Normal status quo	Tremendous scope for other businesses. E.g., Plastic vest sales, Chemicals / additives sales, paints sales, valve manufacturers, materials scientists, robotic solutions, electronics and other
Job creation across world	Normal status quo	Significant increase in the number of jobs that would be created.

Business opportunities
From the color changing concept



- The Color changing concept for Cool Cars has tremendous business opportunities, for the following industries. The top 5 have the maximum potential:
  - Automotive industry. It is transformative to the industry.
  - Plastics / Polymers industry. Massive opportunity to make transparent vests for automobile industry.
  - Paints industry: Spike in demand to make specialized paints for Cool cars.
  - Robotics automation industry: Demand for robots and automation solutions will rise, to enable color change.
  - Chemicals / Additives industry. Will also see significant demand increase; due to making vests and paints with special properties.
  - Automotive insurance business and valves business will also grow.
  - Additionally, demand for raw material, supply chain businesses (suppliers), will see dramatic increase in revenue and growth.

Color changing concept
Other applications



- Take a quick look around in the office to see sample illustration of the concept for Vehicles (2), wall (1), electronic devices (2) and furniture (3).
- Outside the Automotive industry, following sectors can use the 'Cool concept', for personalization needs, choice of consumers.
- Other licensed sectors are listed here in descending order of revenue potential:
  - Walls Sector: For odd walls in houses and offices.
  - Electrical appliances sector: Refrigerators, other hone or office appliances.
  - Electronics sector: TV, Computers, laptops, smartphones, other hand held devices.
  - Furniture sector: Sofa set, bed, dining set, other.
  - Decorative articles sector: Show pieces, Interior decoration articles.
  - Other sector: ATM machines, toys etc.

OEM's will Demonstrate Cool technology at a Premier motor show soon, after IP sale deal with Inventor Srinivas Devathi

Major international motor shows	Timeframe	Location
North American International Auto Show (NAIAS)	Jan	Detroit, MI, USA
Chicago Auto Show	Feb	Chicago, USA
Geneva International Motor Show	March	Geneva, Switzerland
Seoul International Motor Show	April	Seoul, South Korea
New York International Auto Show	April	New York, USA
Concorso d eleganza villa d este	April	Munich, Germany
British International motor show	July-Aug	London, UK
Pebble Beach Concours d elegance	August	Pebble Beach, SF, USA
Moscow international motor show	Aug-Sep	Moscow, Russia
Paris Motor Show	Oct	Paris, France
Sao Paulo Auto Show	Oct-Nov	Sao Paulo, Brazil
Greater LA Auto Show	Nov-Dec	LA, USA
Tokyo Motor Show	Oct-Nov	Chiba-City, Japan
Essen Motor Show	Nov-Dec	Essen, Germany
Motor Show di Bologna (Salone Internazionale dell' Automobile)	Dec	Bologna, Italy

- Listed here are the worlds biggest, most prestigious motor shows.
- Inventor Srinivas Devathi is going to sell the GLOBAL TECHNOLOGY RIGHTS (of 62 countries, individually assigned to each country) in one of the largest deals the World has witnessed till date.
- It will be a 93 Trillion Earthlings / $ deal.
- After the deal, OEM's will robotically demonstrate Cool technology on their brand of 'Cool car' at these Motor shows, at intervals of 30 minutes.

Converting regular car to cool car

Regular cars are all over the world

- Fact: The number of passenger cars that are plying on roads all over the world today is:
  - 1.37 Billion vehicles on road.
  - Of which an estimated 1 Billion are passenger cars.
- One of the largest streams of businesses that will emerge out of this concept is the “Conversion of current day regular cars to cool cars”.
  - These “NEW Cool car conversion” service businesses could open up all over the world.
  - In fact auto manufacturers will open a channel of business services to request current day owners of their car brands, to bring in their cars and convert them to a cool car for a fee.

Steps to convert a regular car to cool car
New cool car conversion businesses

- Manufacture vests for the specifications of the cars brought in. For a service provider, order the vests and get them delivered. <online or from auto maker>
- Customer drops of the car for conversion.
- The exterior body panels are disassembled and separated.
- Minor body work done to accommodate vests.
- The colored body panels are dipped into a solvent to dissolve and remove the existing paint on the cars.
- They are now body in white.
- Any necessary protective coats are applied on them, such as anti rust, anti corrosion, etc.
- The vests are carefully attached / installed with fasteners or other techniques.
- By re-assembling the panels, cool car is created.
- The customer walks in, drives the car into robotic change station and chooses the color he wants for his cool car.

All Other Details of Cool Car technology

Regular car painted surface properties

Appearance properties	Durability properties
Gloss	Gasoline resistance
Distinctiveness of image	Cleanability (Solvent resistance)
Color uniformity (hiding ability)	Acid spotting resistance
Paint film thickness uniformity	Hardness
	Abrasion resistance
	Impact strength
	Adhesion to paint coat
	Accelerated UV resistance or Thermal stability
	Resistance to water and humidity exposure

- The current day regular car painted surface properties are segregated into appearance and durability properties. To deliver such properties in a Cool car, there is need for Chemicals and additives for Vests and paints.

Cool car surface properties

Appearance Property			Durability Property		
In case of 'Cool car' transferred to	**Vest**	**Paint**	**In case of a 'Cool car' transferred to**	**Vest**	**Paint**
Gloss	*		Gasoline resistance	*	
Distinctiveness of image	*		Cleanability (Solvent resistance)	*	
Color uniformity (hiding ability)	*		Acid spotting resistance	*	
Paint film thickness uniformity	*		Hardness	*	
Transparency of vest	*		Abrasion resistance	*	
Paint in vest to remain flowable		**	Impact strength	*	
* represents that a chemical additive will be added while creating the masterbatch for the vest, to deliver the property. ** chemical additive for the paint to deliver the property			Hydrophobic or Non-adhesion of paint	*	
			Adhesion to paint coat	NA	NA
			Accelerated UV resistance or Thermal stability	*	**
			Resistance to water and humidity exposure	*	

Cool car two layer vest properties

Appearance Property			Durability Property		
In case of 'Cool car' transferred to	**Vest (Outer layer)**	**Vest (Inner layer)**	**In case of a 'Cool car' transferred to**	**Vest (Outer layer)**	**Vest (Inner layer)**
Gloss	*		Gasoline resistance	*	
Distinctiveness of image	*		Cleanability (Solvent resistance)	*	
Color uniformity (hiding ability)	*		Acid spotting resistance	*	
Paint film thickness uniformity	*		Hardness	*	
Transparency of vest	*		Abrasion resistance	*	
Hydrophobic or Non-adhesion of paint	*	**	Impact strength	*	**
* Properties needed for outer layer of 2 layered vest. Chemical additives to deliver properties in masterbatch for outer layer. ** Properties needed for inner layer of 2 layered vest. Chemical additives to deliver properties in masterbatch for inner layer.			Adhesion to paint coat	NA	NA
			Accelerated UV resistance or Thermal stability	*	**
			Resistance to water and humidity exposure	*	**

Cost for manufacturing two layered vest can be better managed by eliminating additives to the inner layer of the vest, for unwanted properties. The outer layer would cost more due to the bigger list of properties needed.

Polymers industry
Plus additives industry

- The Polymer industry to deliver the necessary ‘master batch’ uses:
  - Additives / Chemicals
  - ‘Material Science’ scientists or experts to provide guidance and input for desired properties.
- With team effort, the perfect ingredients can be brought together in perfect proportions to deliver the best quality masterbatches resulting in vests with all the desired properties. E.g., Transparency, scratch resistant, desired texture / feel.

Material Science experts inputs

Base polymers such as PE, PP

+

Required additives / chemicals for various properties

=

Masterbatches for manufacturing desired vests

Chemicals / additives industry
Standard properties delivered today

- The chemical additives industry is very mature and they have delivered a range of properties demanded by various applications in the world. Paint applications and plastic applications included.
- It has to be noted that additives while usually added in small amounts, provide / deliver a significant effect on the end product with desired property.
- Here are some of the properties that chemicals / additives industry delivers today, to cater to the industry standard requirements.
  - Modify surface tension
  - Improve flow properties
  - Improve the finished appearance
  - Increase wet edge
  - Improve pigment stability
  - Impart antifreeze properties
  - Control foaming
  - Control skinning
  - Catalysts
  - Thickeners
  - Stabilizers
  - Emulsifiers
  - Texturizers
  - Adhesion promoters
  - UV stabilizers
  - Glossing agents
  - Flatteners (de-glossing agents)
  - Biocides to fight bacterial growth
  - And other

Automated color change
Robotic method

- Robots could automate the color changing process in Cool cars.
- Such a Robotic station could be called as ‘Colorium’.
- Robots could access the micro valves of vests with precision, drain the existing paint, clean the interiors of the vest and inject new color chosen by consumer (electronically from 1000’s of shades).

How much paint is needed?
To change the color of cool car once

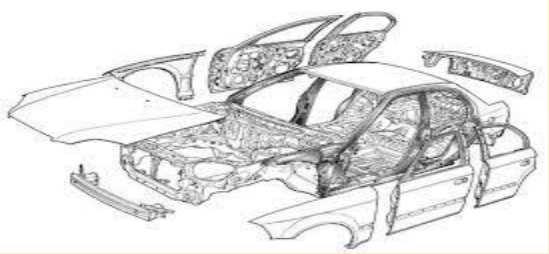
- From the total volume, we have to adjust for the windows, windshields, tires, ground clearance, adjustments for sedan shape.
- By adjusting for these, the more accurate computation is at 60% of total volume computed.
- We believe an optimum vest enclosed space thickness is between 0.1 to 0.5 mm.
- Which means, a single color change would need anywhere between 1.5 to 7 liters of paint.

Vest space thickness	Total volume	@60% of total volume
In mm	In Liters	In Liters
5	117	70.2
2	47	28.2
1	23.5	14.1
0.5	11.75	7.05
0.4	9.4	5.64
0.3	7.05	4.23
0.2	4.7	2.82
0.1	2.35	1.41
0.01	0.235	0.141
(Micron) 0.001	0.0235	0.0141

Volume in liters	Vest width		
Rounded numbers	1 mm	2 mm	5 mm
Side 1	7.2	14.4	36
Side 2	7.2	14.4	36
Top	9.1	18.2	45
Total Volume	23.5	47	117

A typical Sedan	Length	Width	Height
In Inches	192	73	58
In Centimeters	487.68	185.42	147.32
In Meters	4.9	1.85	1.5

Cost comparison
Per car (re)painting cost estimates



Country / comment	Regular car	Cool car
India	4-8% of car sale price	Lower. 2-3% of car sale price
Sample price, for a INR 400,000 car	16,000 to 32,000 INR	Lower. 8,000 to 12,000 INR
Repainting of an INR 400,000 car	30,000 to 100,000 INR, depending on quality	1,000 to 10,000 INR, depending on quality
Repainting	Not repeatable	Highly repeatable
USA	5-10% of car sale price	Lower. 3-4% of car sale price
Sample price, for a $ 30,000 car	1,500 to 3,000 $	Lower. 900 to 1,200 $
Repainting of a $ 30,000 car	1,000 to 10,000 $, depending on quality	100 to 3,000 $, depending on quality
Repainting	Not repeatable	Highly repeatable

Automotive industry simplified

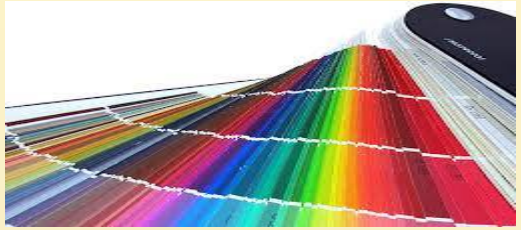
Regular car

- Need massive paint shops at the manufacturing plants
- 1000's of liters of paint, by each color have to be maintained.
- 1000's of liters of various pre paint, post paint chemicals are needed.
- Multiple coats such as prime coat, base coat, color coat, clear coat, wax coat have to be given to vehicle.
- Further paint shop needs huge capital investment in robots, massive dip tanks for liquids, overhead lines, lots of safety and protection gear for workers etc.

Cool car

- Paint shop eliminated by 100%
- However, the protective coats for the 'body in white', such as anti rust, anti corrosion and prime coats may still be needed, and can be transferred to sheet metal roll manufacturers / suppliers.
- Vests installed at the Body in white stage.
- Workers don't have to deal with hazardous materials. They are much safe at the plant.
- Capital costs significantly reduced.
- Operational costs also significantly reduced.

Automotive paint business Simplified



Regular car

- Paint should dry on surface.
- Should stick with great adhesion to surface.
- A dozen properties required for the paint materials.
- Paints very expensive due to the number of additives needed to deliver the properties.
- Only available in handful of colors. Customer cannot change color at will.

Cool car

- Paint should never dry, and always remain flowable.
- Should have no adhesive properties or qualities.
- Further vest will be given hydrophobic coating, for anti-adhesive properties.
- Paints just need simple properties such as UV resistance, thermal stability and anti-freeze.
- Paints cost reduced. But volume sales increased.
- Available to customer in 1000's of color shades to choose from, as in a paint catalogue.

What does it mean to the World? And India.

World

a) Improved entrepreneurial opportunities.

b) Improved job creation.

c) Improved global economic growth.

d) Improved stimulus to global trade.

e) Significant boost to the automotive industry.

f) Spike in demand for Robots and Robotic automation solutions.

g) Boost to all related industries.

h) Increased demand for raw materials and related commodities.

i) Wealth created could help develop other developing and under developed countries in the World, based on CSR budgets.

India

1) All the benefits listed for World, also apply to India.

2) Wealth created by this concept could be invested in solving societal problems in India and making it very competitive on the world stage. E.g., investing in education system in India.

3) Wealth created by this concept could drive India towards becoming a developed country, from its current developing country status.

e) Wealth created by this concept will allow us to take up CSR work and philanthropic initiatives in India.

f) This concept fits well into the growth initiatives taken up by Indian government.

1800+ shades of colors available in market today