CS30A7381SS Systematic Creativity and TRIZ basics Online

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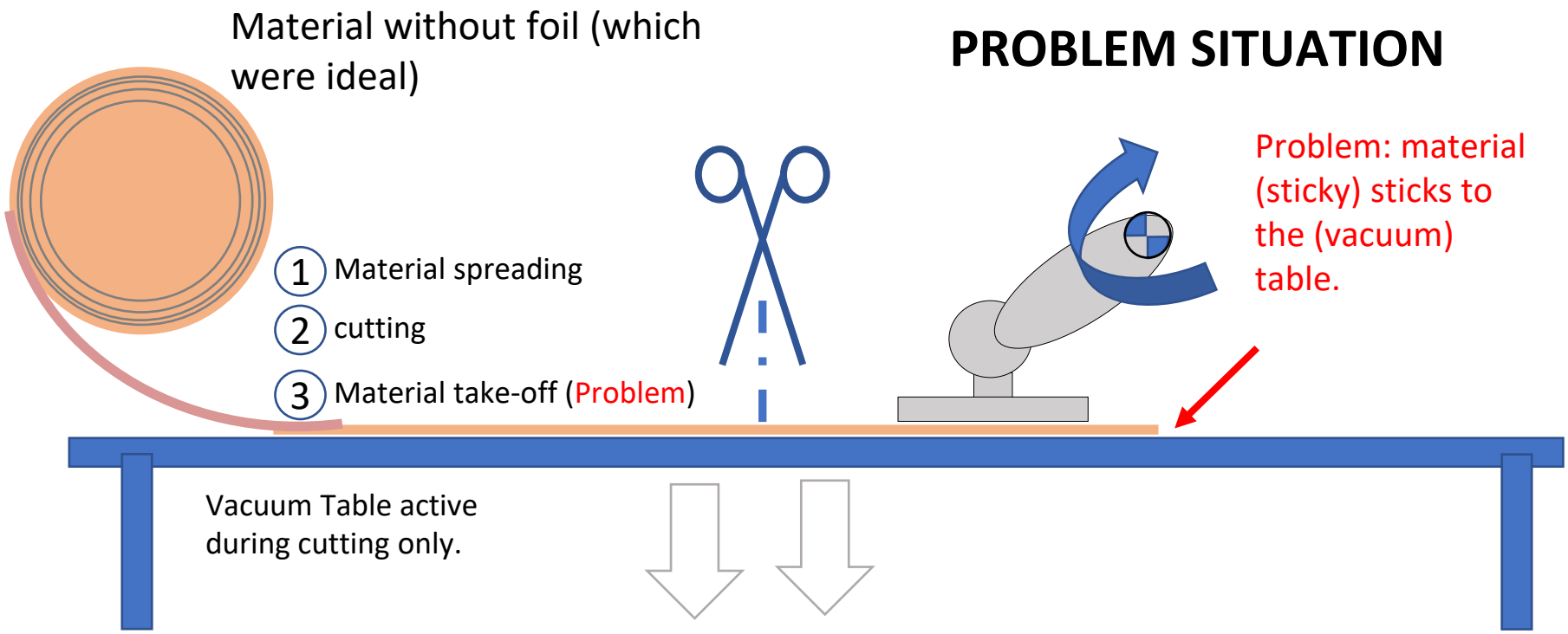
Overview

- 1) Introduction to your topic (Chapter 2)
- 2) Patents for your system (Chapter 3)
- 3) Function of your system (Chapter 4)
- 4) Function Oriented Search (Chapter 5) & Applying of biomimetrics to your system (Chapter 6)
- 6) Ideal Final Result for your system (Chapter 7)
- 7) Contradictions for your system (Chapter 8)
- 8) TESE for your system (Chapter 9)

1) Introduction to my topic (Chapter 2)

Description: We do have a sticky material / textile that need to be spread and smoothened nicely to be cut without folds. The stickiness of the material is no problem here, but later on, when we want to take-off the material we face basically two problems: the material is too sticky and even if we manage to take if off the table, the table dirtens over the time.
Picture: See next slide.

1) Introduction to my topic (Chapter 2) – Picture

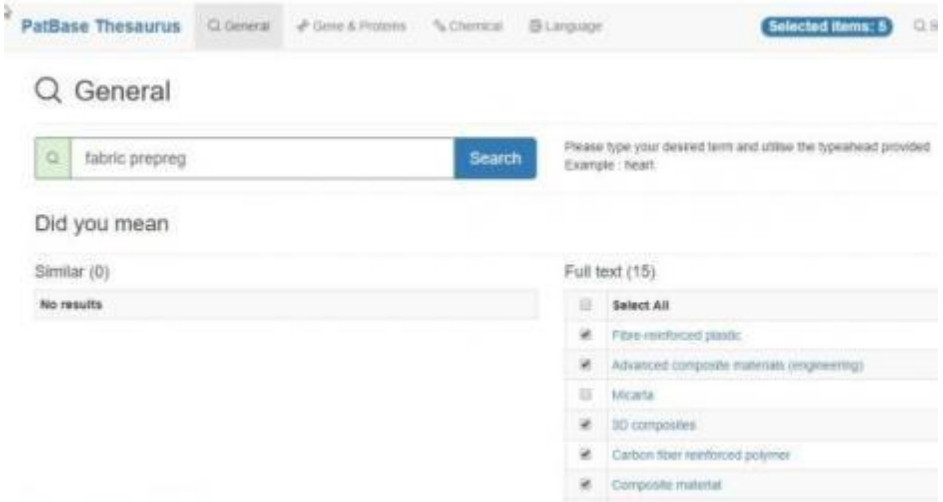


2) Patents for your system (Chapter 3) 1 of 3

Basically I have the problem of different terms in different languages for the system. First job is to Identify an initial set of keywords. The main subject is the sticky textile garment where I need to find patents for. I use a special Thesaurus (the one with Patbase) to get first of all the right terms in english (see picture). In general one has to ensure to cover multiple languages (I do this by semantic searches with textmine from Patbase).

2) Patents for your system (Chapter 3) 2 of 3

I take these terms and add reasonable functional verbs to start my search routine (here: STAC=(composite OR prepreg) and remove and foil gives about 600 results).
I reduce the number of patents by introducing various further terms that might be in (various trials).



If I look if there is an active patent, that might hamper my solution path, I reduce the number of patents to living ones (patent legal status) and by patent class search.
If - as here - I am looking for solutions to my problem, I do not limit the number of hits by status or class but use additional terms (here the word peel). This reduced the number of hits to 33.

2) Patents for your system (Chapter 3) 3 of 3

These I went through. Then it stated several loops due to better seach term based on reading related patents.

Finally the search string:

"((peel or remove) wf5 backing paper) and (prepreg or pre-preg or composite) not board not circuit“

found two intersting patents.

Know when to stop looking !

3) Function of your system (Chapter 4) 1 of 3

Function Model of actual Situation

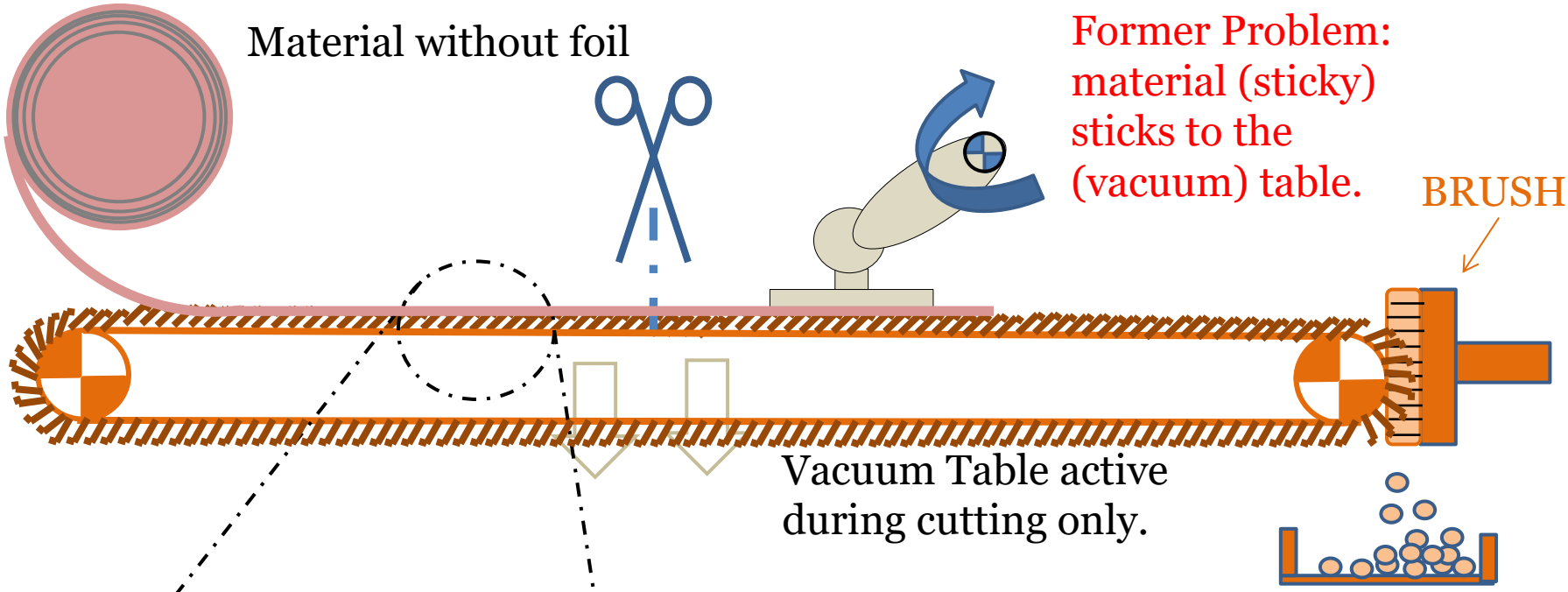
Marks on timeline	Function			Type and level of Performance	Location	Comments
	Function Carrier	Action	Object of Function			
Event or period	Noun, substance or field	verb	Noun, substance or field	I (insufficient), NU(normal useful), E (excessive), H (harmful), N (neutral)	above/below/left/right, etc. the target	Whatever seems relevant
t0	Table	fixes	Textile	N	At place of cutting	
t10	Table	Fixes	Textile	H	At place of take-off	
t0-t10	Table	Collects	Dirt particles	H	Everywhere on table	

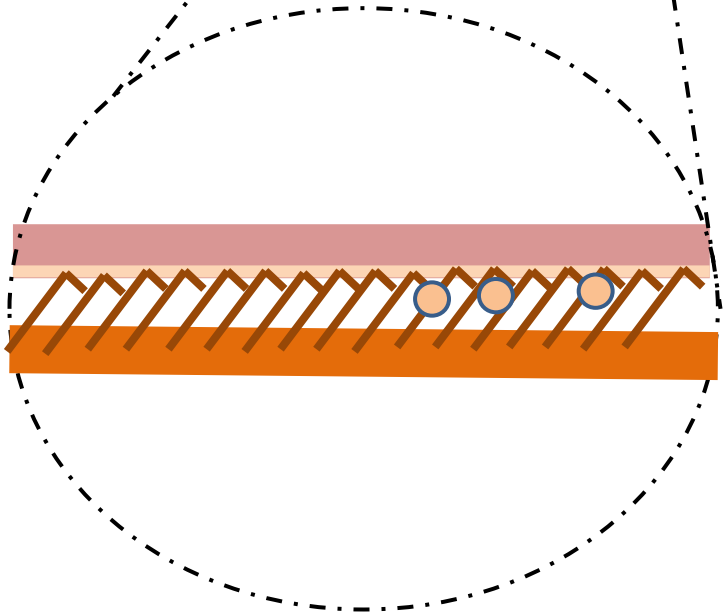
3) Function of your system (Chapter 4) 2 of 3

Function Model after Introduction of Additional Intermediate Objects (hairy table surface and Brush)

Marks on timeline	Function			Type and level of Performance	Location	Comments
	Function Carrier	Action	Object of Function			
Event or period	Noun, substance or field	verb	Noun, substance or field	I (insufficient), NU(normal useful), E (excessive), H (harmful), N (neutral)	above/below/left/right, etc. the target	Whatever seems relevant
t0	Hairy table surface	fixes	Textile	NU	At place of cutting	
t10	Hairy table surface	Fixes	Textile	H	At place of take-off	
t0-t10	Hairy table surface	Collect	Dirt particles	H	Everywhere on table	
t20	Brush	removes	Dirt particles	N	At end of conveyor table	
…	…	…	…	…	…	…

3) Function of your system (Chapter 4) 3 of 3





Biomimetric motivated Solution:

Using a special cutting table surface as upper layer on conveyor belt. This surface is like hairy foot pads of flies (see https://asknature.org/strategy/adhesive-foot-pads-self-clean/#.XEOEllxKhPY). The sticky material will still a little bit dirten these hairs but this dirt will not stick heavily to the hairs and can be brushed off (the flies lose the dirt by walking).

4) Function Oriented Search (Chapter 5) & Applying of biomimetrics to your system (Chapter 6)

A generalized function is two surfaces sticking together because one has an adhesive and at a later point of time the surfaces shall be easily separated. The industry to adapt a solution from is the military. There is (a lotus –effect based) impregnating spray coating for the uniforms to prevent wetting (and dirting) during combat. Therefore the adapted solution uses regular spray coating the table surface, so that it does to take up adhesive particles and therefore does not dirten.

6) Ideal Final Result for your system (Chapter 7)

- IFR would mean that the material loses its stickiness itself at point of take-off.

- E.g. (in preventing mode) The table is prepared to take up the dirt during the processing ?
- E.g. (in fighting mode) Material dirtens but we fight the dirt later on ?
- E.g. (in ignore mode) the Material dirtens but the system is not harmed ?

7) Contradictions for your system (Chapter 8)

- The material shall stick to the table to allow cutting, but shall not stick to the material to prevent dirtening/take-off problems.

- This is no technical but physical contradiction. Therefore we cannot use the contradiction matrix. We have to apply separation principles (typically separation of time or scale) to remove this contradiction.
- Both separation principles have their benefit here: We have different places where we need the different attributes of the material and we do have different timing (process time) as well.

- Example approach: use consumable chemicals or physical condition (temperature) that change the attritube (stickiness). E.g. Cool the table by approx. 3-4 degree C. This reduces the tack/stickiness sufficiently (but it might bring up problems of unallowed wetting due to humidity). Using of chemicals that change the stickiness sounds well but cmpatibility issues in the following processes.

8) TESE for your system (Chapter 9)

- That is quite difficult for such a system. Anyway, I will provide here some ideas:
- Trends of S-curve evolution: self –adaptation of optimized sized textile.
- Trend of increasing value: not only cutting textile but the whole stack /full 3D complexity of finished part.
- Trend of Optimization of flows: Cutting and take-off at the same process step.