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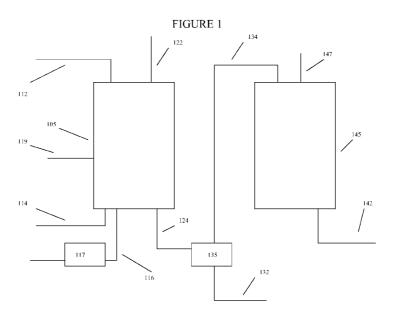
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(54) Title: HYDROPROCESSING OF BIOCOMPONENT FEEDS WITH LOW PRESSURE HYDROGEN-CONTAINING **STREAMS**



(57) Abstract: The invention relates to a method for forming an at least partially renewable diesel product, comprising: hydrodeoxygenating a feedstock comprising about 0.1 wt% to about 50 wt% of a fresh biocomponent portion with a relatively pure hydrogen treat gas in the presence of a hydrodeoxygenation catalyst under relatively low total pressure to form a hydrodeoxygenated product; and separating the hydrodeoxygenated product into a vapor effluent and a liquid effluent, at least a first portion of the latter being recycled to the hydrodeoxygenation step, and at least a second portion of the latter being a diesel product. Advantageously, the hydrodeoxygenation catalyst can have a relatively low catalytic activity (about 50% or less of fresh HDS/HDN activity).





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Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data											
C. DOCUM	ENTS CONSIDERED TO BE R	RELEVANT									
Category*	Oitation of document, with inc	dication, where app	ropriate, of the rele	evant passag	jes 		Relevant to claim No.				
X	US 2009/08260 AL) 26 March figure 3 paragraph [00 paragraph [00 paragraph [00 claims 1-20	2009 (2009 010] 016] - para	9-03-26) .graph [00]	 17]	ET		1-15				
A	US 2008/15407 AL) 26 June 2 paragraph [00 paragraph [00 paragraph [00 example 3; ta	2008 (2008- 106] 116] 117] - para	06-26)		Г		1-15				
Furt	her documents are listed in the	continuation of Box	∢C.	X Se	e patent famil	y annex.					
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Patent document cited in search report		Publication date	Patent family member(s)			Publication date
US 2009082606	A1	26-03-2009	AR	068491	A1	18-11-2009
			ΑU	2008302503	Α1	26-03-2009
			CA	2696399	A1	26-03-2009
			CN	101801893	Α	11-08-2010
			EP	2188235	A2	26-05-2010
			PE	09202009	A1	18-07-2009
			TW	200923061	Α	01-06-2009
			US	2009082606	Α1	26-03-2009
			US	2011024327	A1	03-02-2011
			WO	2009039000	A2	26-03-2009
US 2008154073	A1	26-06-2008	NONE			