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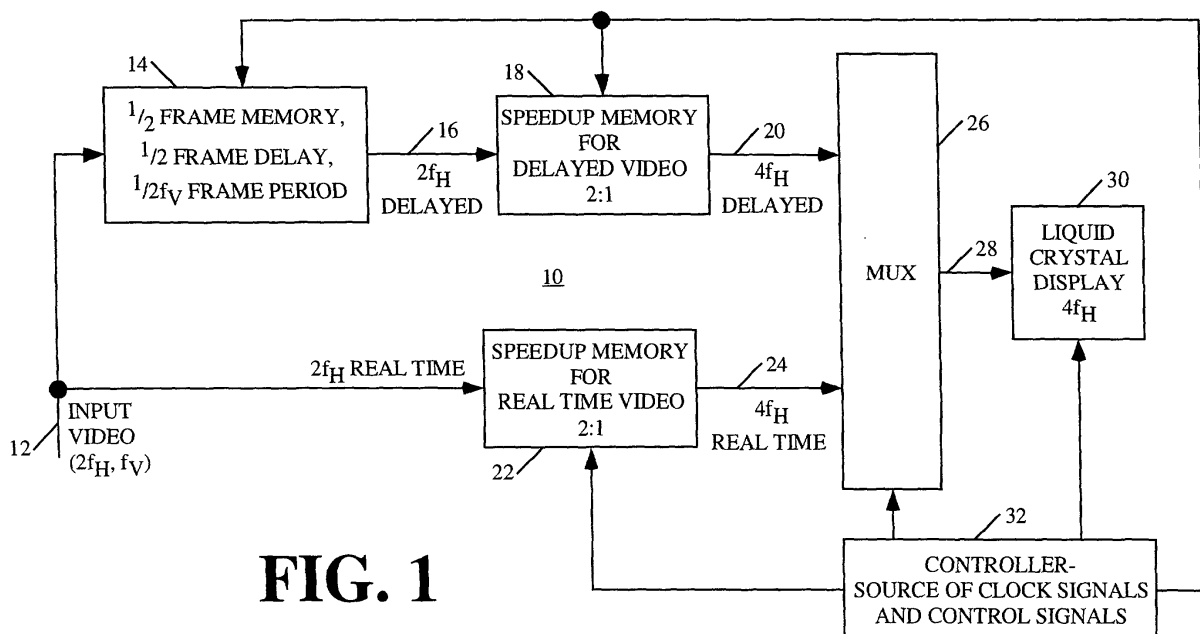
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(54) **Frame rate multiplier for liquid crystal display**

(57) A method for multiplying the frame rate of an input video signal having a line rate  $f_{H,in}$  and a frame rate  $f_{V,in}$ , comprising the steps of: propagating the input video signal through just enough memory to delay the input video signal by a fraction of a frame period  $1/f_{V,in}$ ; speeding up the delayed video signal to a first line rate faster than  $f_{H,in}$ ; speeding up the input video signal to a second line rate faster than  $f_{H,in}$ ; supplying the speeded up video

signal and the delayed speeded up video signal sequentially, one line at a time; and, writing the sequentially supplied lines into a liquid crystal display at the faster line rate, thereby writing at least some of the lines multiple times within each the frame period. A corresponding apparatus can comprise: a partial frame memory; two speedup memories; a multiplexer; and, a source of clock and control signals.



**FIG. 1**



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 2 159 656 A (SHARP KK) 4 December 1985 (1985-12-04) * the whole document *	1-31	INV. G09G3/36 H04N3/12
A	US 6 091 386 A (BASSETTI CHESTER F [US] ET AL) 18 July 2000 (2000-07-18) * column 9, line 43 - column 10, line 16; figure 13 *	1-31	
			TECHNICAL FIELDS SEARCHED (IPC)
			G09G
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		25 January 2007	VAN WESENBECK, R
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone                      Y : particularly relevant if combined with another document of the same category                      A : technological background                      O : non-written disclosure                      P : intermediate document</p> <p>T : theory or principle underlying the invention                      E : earlier patent document, but published on, or after the filing date                      D : document cited in the application                      L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 29 0583

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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25-01-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2159656      A	04-12-1985	DE 3519794 A1	05-12-1985
		JP 1602422 C	26-03-1991
		JP 2028873 B	26-06-1990
		JP 60257497 A	19-12-1985
		US 4845473 A	04-07-1989
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US 6091386      A	18-07-2000	NONE	
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	用于液晶显示器的帧速率倍增器		
公开(公告)号	<a href="#">EP1241656A3</a>	公开(公告)日	2007-02-28
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[标]申请(专利权)人(译)	汤姆森特许公司		
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当前申请(专利权)人(译)	汤姆森许可		
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优先权	09/804554 2001-03-12 US		
其他公开文献	EP1241656A2 EP1241656B1		
外部链接	<a href="#">Espacenet</a>		

摘要(译)

一种用于将具有线速率 $f_{Hin}$ 的输入视频信号的帧速率与帧速率 $f_{Vin}$ 相乘的方法，包括步骤：通过恰好足够的存储器传播输入视频信号，以将输入视频信号延迟一段帧周期 $1/f_{Vin}$ ；将延迟的视频信号加速到比 $f_{Hin}$ 更快的第一线速率；将输入视频信号加速到比 $f_{Hin}$ 更快的第二线速率；按顺序提供加速视频信号和延迟加速视频信号，一次一行；并且，以较快的线速率将顺序提供的线写入液晶显示器，从而在每个帧周期内多次写入至少一些线。相应的装置可包括：部分帧存储器；两个加速记忆；多路复用器；并且，时钟和控制信号的来源。

